December 22, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 27

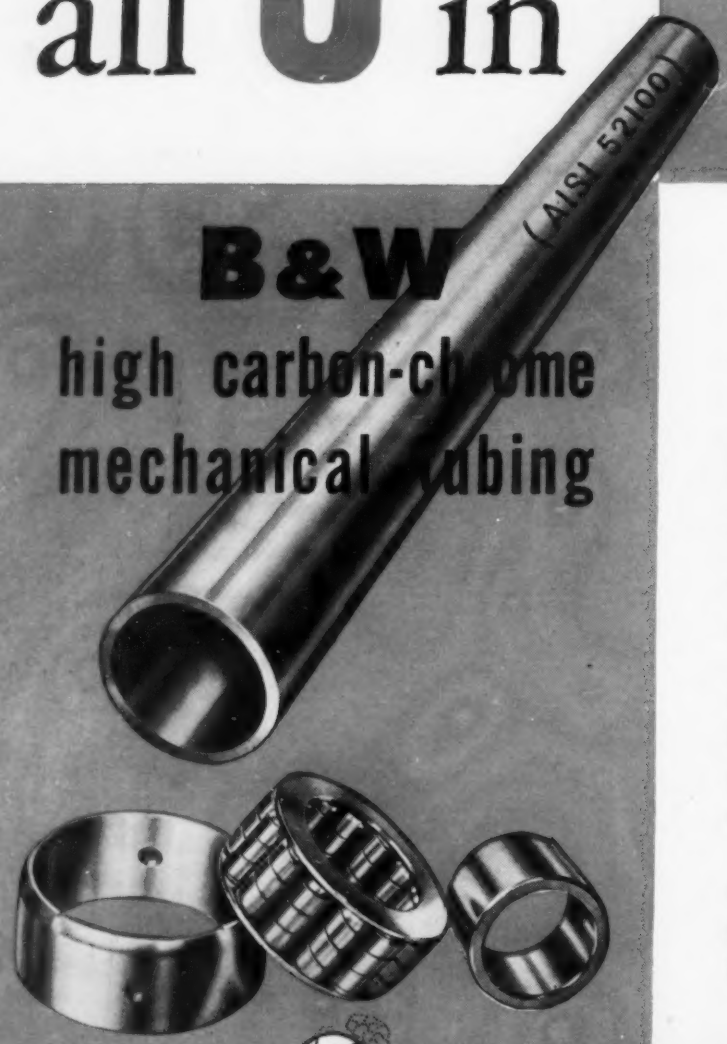
STEEL LIBRARY
DEC 20 1947
DETROIT

Season's Greetings
Thomas Strip
REG. U.S. PAT. OFF.
THE THOMAS STEEL CO.
WARREN • OHIO
SPECIALIZED PRODUCERS OF COATED AND UNCOATED COLD ROLLED STRIP STEEL

You get all 5 in

- Extreme wear resistance
- Excellent machinability
- High tensile strength
- High fatigue strength
- Extreme hardenability

B&W high carbon-chrome mechanical tubing



Because of its unusual combination of properties, B&W High Carbon-Chrome (AISI 52100) Mechanical Tubing is an ideal design and production short-cut to many mechanical parts such as . . . bushings, stamping tools, dies, machine parts, thrust collars, collets, etc. These same properties account for the wide use of this tubing for races and spacers in anti-friction bearings.

The care and accuracy in B&W annealing methods give this tubing excellent machinability. In the as-quenched condition, it is a through hardening oil-quenching steel with maximum Rockwell C hardness of 65/66.

Perhaps some parts you are now making can be made faster, cheaper and better by using B&W 52100 Tubing. Write for full information.

Seamless and Welded Tubular Products in a full range of Carbon, Alloy, and Stainless Steels for All Pressure and Mechanical Applications.

★ ★ ★

Other B&W Products

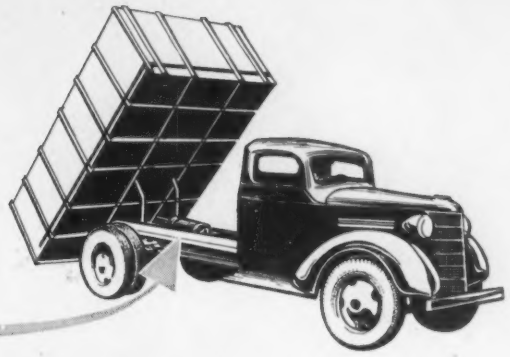
THE BABCOCK & WILCOX CO.
85 LIBERTY STREET · NEW YORK 6, N. Y.

Stationary and Marine Boilers . . . Boiler Components . . . Pulverizers . . . Fuel Burning Equipment . . . Refractories . . . Chemical Recovery Units . . . Process Equipment . . . Alloy Castings.

BABCOCK & WILCOX
SEAMLESS & WELDED TUBES
THE BABCOCK & WILCOX TUBE COMPANY
GENERAL OFFICES: BEAVER FALLS, PA.
PLANTS: BEAVER FALLS, PA. AND ALLIANCE, OHIO.

TA-1416-M

Dump-Truck Side Rails



made from

Cold-Formed Shapes

These husky Z- and channel-sections have a real job on their hands—helping to provide a sturdy, rigid base to support the body-tilting sections of hydraulic dump-trucks. Formed cold from steel sheets, they are supplied to the manufacturer in lengths of approximately 10 ft.

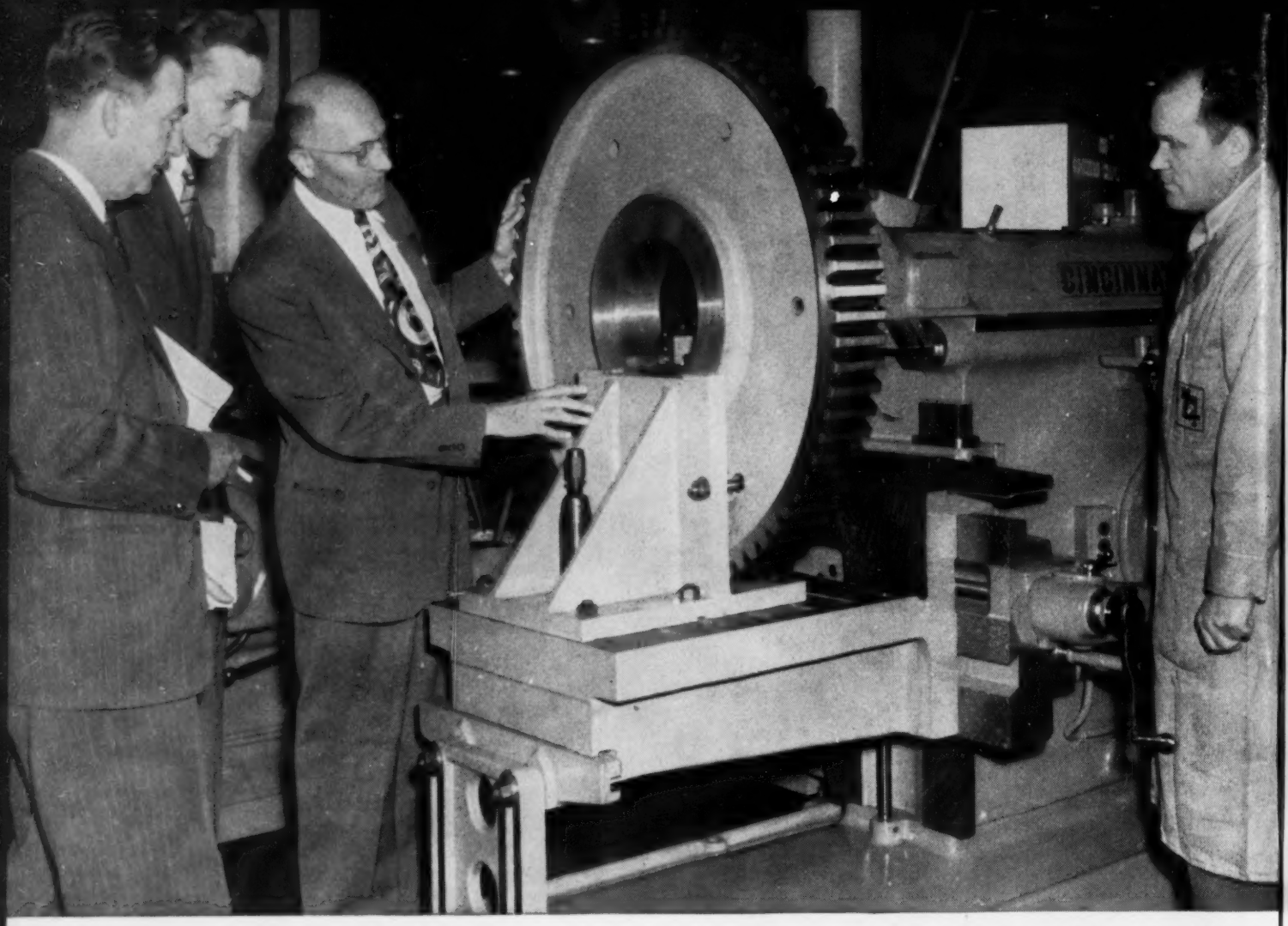
Because of their versatility and economy Bethlehem Cold-Formed Shapes are continually providing new advantages, chalking up new savings for manufacturers in many fields.

Bethlehem Cold-Formed Shapes are uniform in gauge and section. They are easy to form, and they have an excellent surface. We turn them out on presses, brakes or rolls in gauges from 7 to 24, inclusive, our specialized facilities enabling us to meet practically any requirement of style or length.

We'll be glad to discuss ways in which Bethlehem Cold-Formed Shapes may serve to your advantage. Get in touch with the nearest Bethlehem district office, or drop a line to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



* Demonstration at Machine Tool Show, Chicago.

HANDY!

There is always another job you can do on a Cincinnati Shaper—*"the handy man of industry"*. Planing, contouring, keyseating, angular work, internal shaping—all are regularly done with simple tooling and quick setups.

With the use of practical and inexpensive accessories, many awkward and unusual jobs are done simply and economically along with the regular work.

When you put a Cincinnati Shaper on the floor, that floor space pays dividends.

Write for catalog N-3.

* Cutting keyways in these large gears—which were both heavy and awkward—was done on a Cincinnati Heavy Duty Shaper equipped with a table with removable top, a boom crane, and a simple, inexpensive fixture. Can we help you with your special job?

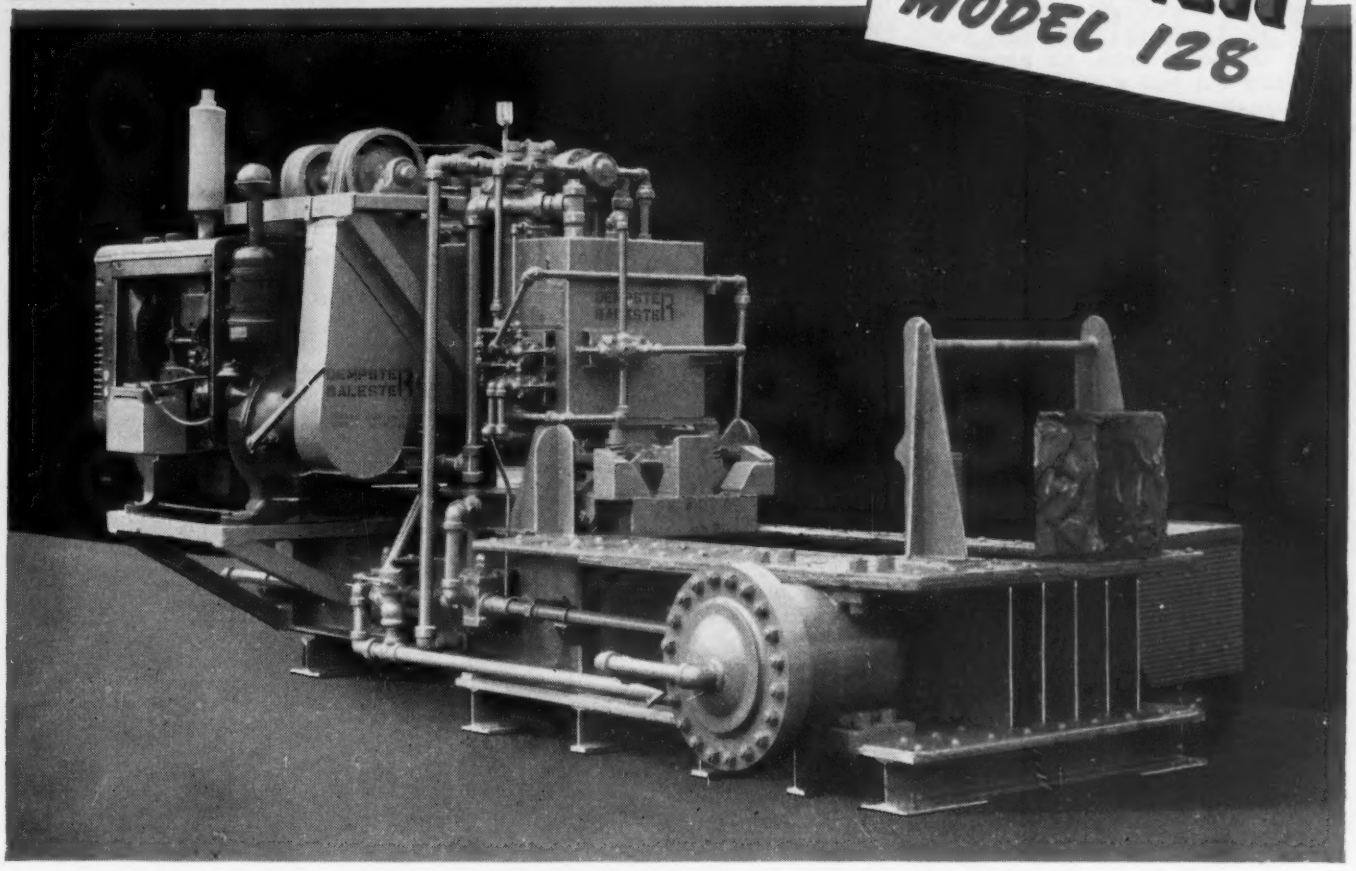
THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

FOR HIGH SPEED SCRAP METAL BALING

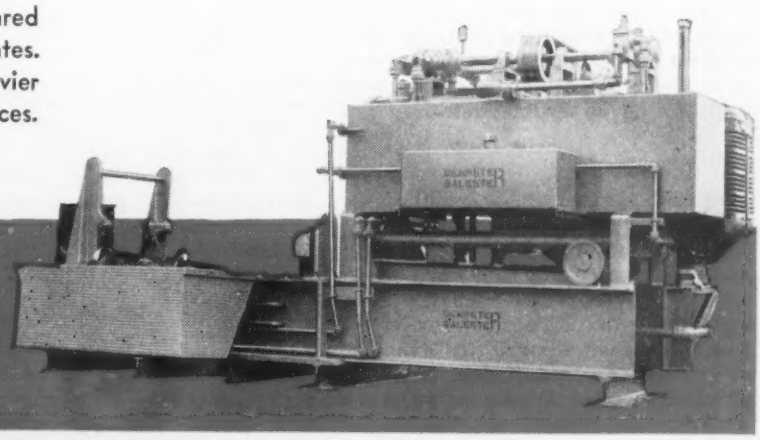
DEMPSTER BALESTER MODEL 128



If you are looking for a portable baling press built to deliver dependable service at high speeds, you'll find it in the new Dempster-Balester Model 128. Featuring two hydraulic pumps, one a double pump, and an extra large oil tank, the Model 128 speeds up hydraulic operations about 50 percent . . . resulting in greatly increased production.

On the Dempster-Balester 128, all points are built oversize to withstand internal stresses beyond the normal need of baling. Charging box is squared and lined with smooth, machined, abrasion plates. Delivers a high density 125 pound and heavier bale that is easily handled from baler to furnaces.

The Dempster-Balester 128 is available with either Electric, Diesel or Gas Motors. This applies also to the Model 125 standard baler and the Model 275, a heavy duty baler that delivers 300 pound bales. One of these is certain to fit your baling requirements. Write or wire today for complete information.



DEMPSTER BALESTER

TRADE MARK REG.

DEMPSTER BROTHERS, Inc., 5127 Springdale Ave., Knoxville 17, Tenn.

Behind the Scenes...

Round the Barn for Steel

The steel shortage is breeding all kinds of special deals, all aimed at squeezing out just a little more tonnage—making two apples grow where only one was before, so to speak. One of the latest we've heard about (we haven't verified it) concerns an oil company which needed some casing, so it might increase the flow of fuel oil to its customers. One of these customers happened to be a producer of coke—probably a public utility outfit, not a steel mill—and in return for an increased allotment of oil, this outfit we're talking about was permitted to buy a quantity of coke. The coke was then resold to a blast furnace in return for pig iron, which was allotted to a steel producer in return for ingot. The ingot was then converted to plate by another mill and shipped to a converting plant where it was fabricated into welded pipe. The whole deal is supposed to have ballooned the price to about 200% of normal, but the oil company is reportedly satisfied. Some sheet arrangements are supposed to be even more complicated than that, but we wouldn't want to have the job of unravelling the tangled skeins on some of those. Suffice it to say that the expediter, born of wartime problems, is again on the road, crowding the nation's club cars, and the seats outside the purchasing agent's door are about as empty as they were back in '43, '44 and '45.

Disappeared Fish

One of our friends who's in the tinplate business says that the most important mystery of the year has nothing to do with the Russian situation, the atom bomb, or the Republican candidate for 1948. He says it's about sardines, and in particular, what has happened to millions upon millions of them, suddenly vanished from the sea. Anybody around here want to be a sardine detective?

Two Bucks, Faded

Seems that the beasts of the forest and the fowl of the field have developed a new reflex tendency. They seem to know instinctively when the hunting season arrives. We've suspected this for some time, from the pheasants which appear in our back yard during November and which disappear at all other seasons of the year. Comes now a story from Youngstown that a couple of buck deer invaded the hot strip mill of Youngstown Sheet & Tube, trying no doubt to avoid the steelworkers who invaded their territory, equipped with deer rifles. The plan wasn't too successful, however, because one of them got tangled up in the runout table and after being well-greased, skidded across the floor and wound up in the coiler pit. There one of the boys, no doubt an ex-footballer, tackled the buck, called the plant cops, and gave it the same treatment anybody gets who enters the plant without the proper pass. They took it to the front gate and hoisted it out, without ceremony! The second buck didn't fare so well. He tried to jump over a blast furnace, which proved a little too high, and wound up on a slag pile with a broken leg. Inmates at the county home reportedly enjoyed the venison dinner. All this prompts us to say that a couple of loose bucks can cause trouble in a steel plant, as where can't they?

All About No Iron

We can't close the book on last week's issue without another mention of the superb job our editors did on that summary of the pig iron situation. We're swamped with requests for tear sheets and reprints, so if you are one of the requesters, please take note that we're slowly catching up and you can expect your additional copy soon. If you would like an extra copy of this special report but haven't yet told us about it, we'll be glad to see that you get one. Drop us a line.

Here, First, Again

Editorially, they're chuckling happily to themselves, those guys upstairs. All over the latest scoop, announcement of a new sheet mill at Portsmouth Steel. Came out last week, but you readers of STEEL had the information three weeks before, in that special article our boys did on Portsmouth. First again, of course!

Shrdlu

(Editorial Index—page 27)

STEEL

Vol. 121—No. 25 December 22, 1947

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

ADVERTISING

R. C. JAENKE
Advertising Manager

C. H. BAILEY
Service Manager

A. V. ANDERSON
Production Manager

New York:
E. W. KREUTZBERG, K. A. ZOLLNER
Pittsburgh:
S. H. JASPER, B. C. SNELL
Chicago:
L. C. PELOTT, V. G. BRETTMAN
Cleveland:
D. C. KIEFER, H. G. ROWLAND
Los Angeles:
F. J. FULLER

•

CIRCULATION AND MARKET RESEARCH

J. W. ZUBER
Director
R. L. HARTFORD
Research Manager
H. E. METZNER
Circulation
R. C. RICE
Readers' Service
G. R. EBERSOLE
Mail & List Service

Field Representatives:
H. R. DUNNE
D. G. HEWITT
G. D. LUKE
C. PETTIGREW
C. A. PRICE

•

MAIN OFFICE

Penton Building, Cleveland 13, Ohio

BRANCH OFFICES

New York 17.....16 East 43rd St.
Chicago 11.....520 North Michigan Ave.
Pittsburgh 19.....2806 Koppers Bldg.
Detroit 2.....6560 Cass Ave.
Washington 4...956 National Press Bldg.
Los Angeles 4.130 N. New Hampshire Ave.
London: 2 Caxton St., Westminster, S.W.1

• • •

Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1947 by the Penton Publishing Co.

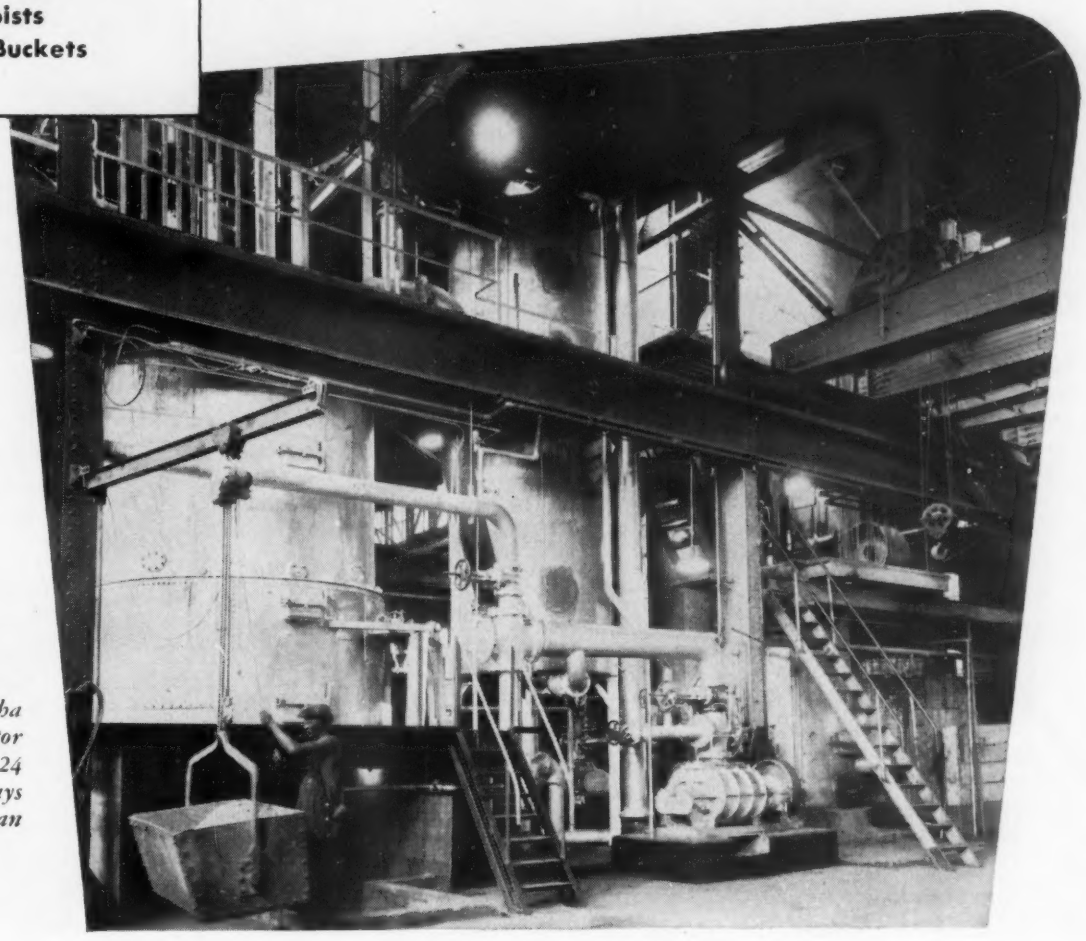
Editorial Staff on Contents Page

Wellman will build it

Special Cranes
Gas Producer Plants
Ore Bridges
Charging Machines
Industrial Furnaces
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
Skip Hoists
Clamshell Buckets

Wellman-Galusha Clean Gas Generators

Compact! Complete! Efficient!



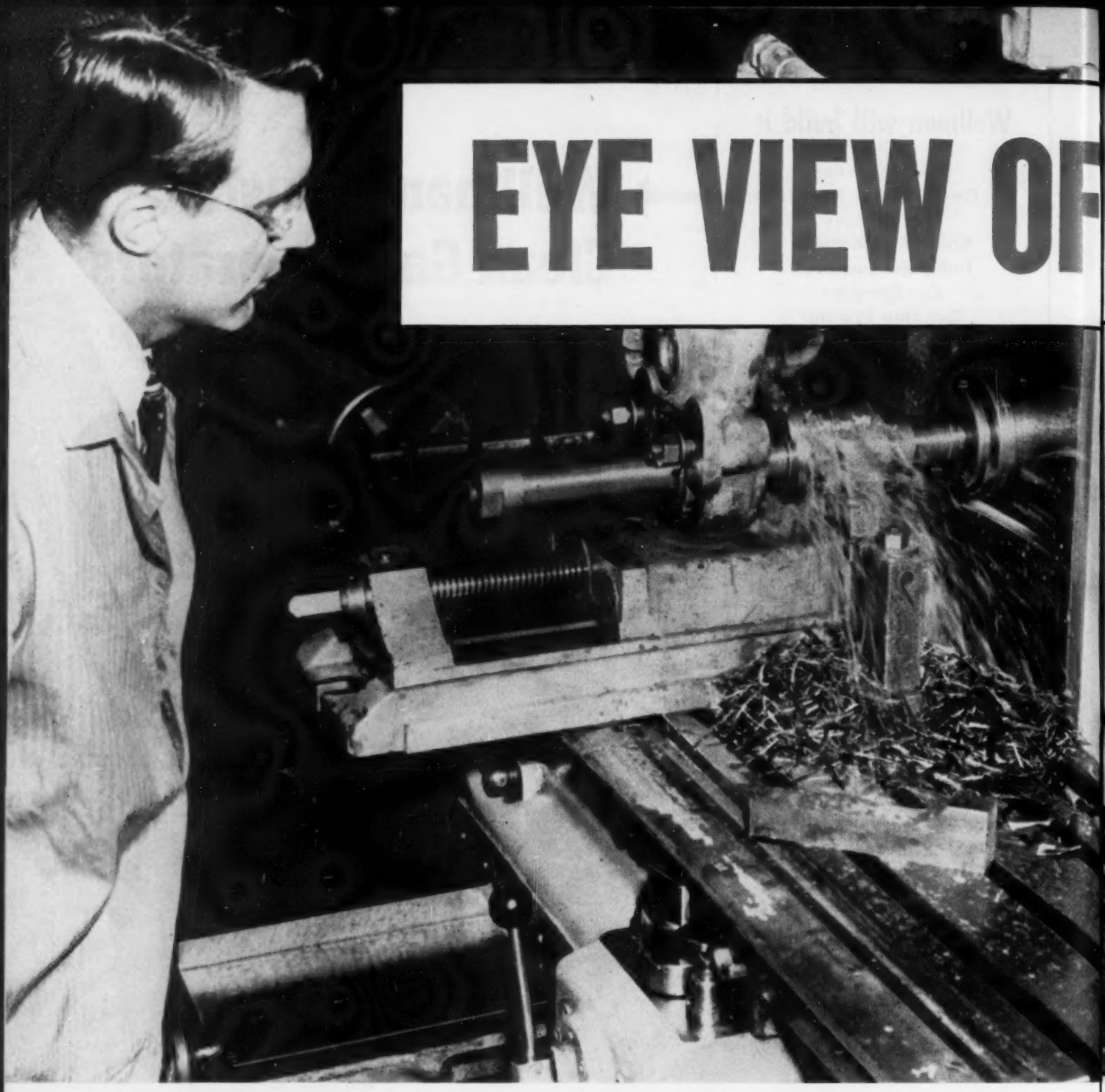
This Wellman-Galusha Clean Gas Generator has been operating 24 hours a day, seven days a week, for more than 17 years.

• The Wellman-Galusha Clean Gas Generator will serve your purpose best because it is a fully water-jacketed gas generator that incorporates, in the machine itself, rotary grates, ample fuel storage bins, and full provisions for the generation of steam required for gas making.

THE WELLMAN ENGINEERING COMPANY

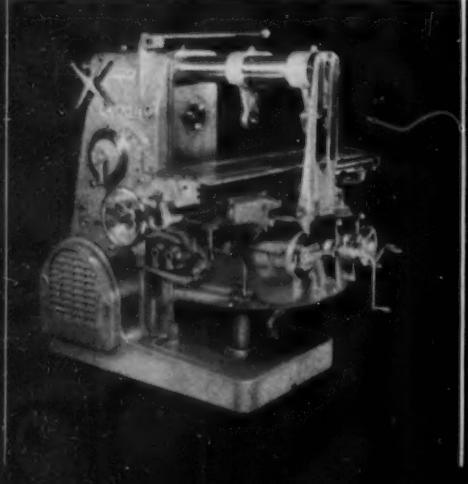
7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

EYE VIEW OF P

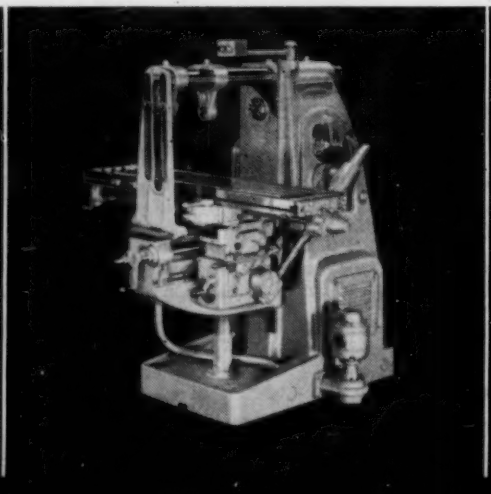


Kearney & Trecker CSM 20 Automatic Cycle Plain with a carbide cutter removing 14.8 cu. ipm of SAE 1045 steel in one pass! Feed rate: 15¾ ipm. Cutter speed: 235 sfm. Depth of cut: .750 in. Production rate: 60 finished parts per hour.

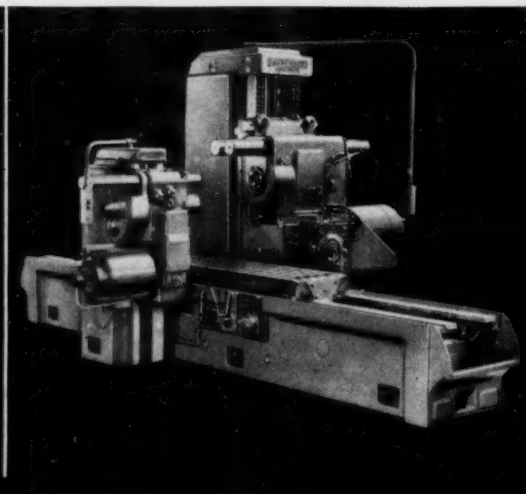
MODEL 2K PLAIN AUTOMATIC CYCLE MILLING MACHINE — The famous Model K machines with Automatic Cycle are available in three sizes and in both Plain and Vertical types.



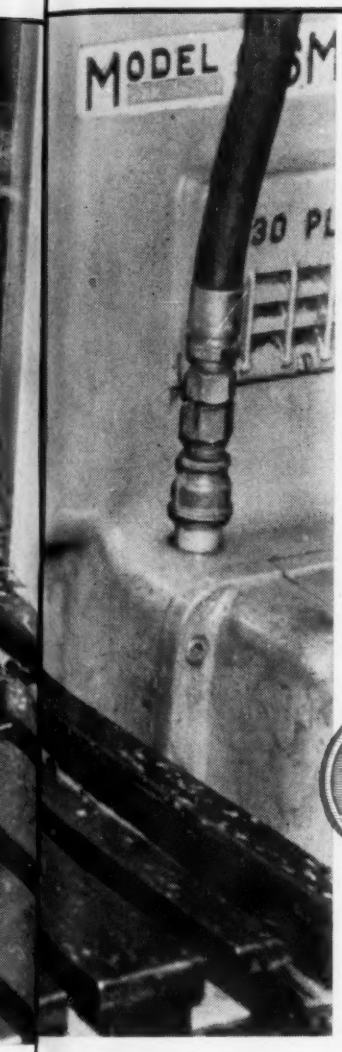
MODEL E PLAIN MILLING MACHINE —This new simplified milling machine design gives you every fundamental requirement—plus highest dollar for dollar value obtainable anywhere.



NEW DUPLEX BED-TYPE MILLING MACHINE —Kearney & Trecker's new concept of bed-type design. Gives you wide working ranges and horse-power capacities for most effective use of all cutting tools.



PROFITS IN MAKING



New Kearney & Trecker-Milwaukee Automatic Cycle Milling Machine produces a part-a-minute, floor-to-floor time! Reduces operator fatigue and manufacturing costs.

WOULD you like to cut milling costs, get greater operator efficiency with less fatigue, increase production? Here's how you can:

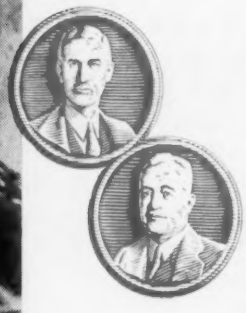
Investigate the new Kearney & Trecker Automatic Cycle Knee-type milling machines — a complete line of 28 different Plain and Vertical models.

What are their advantages? Look at the picture and the job data at the left.

How did the Automatic Cycle feature work on this job? Using a single set-up, the operator set his Automatic Cycle stops, started the machine and let it do the rest — rapid traverse to feed position, mill, rapid traverse back to load and unload position and stop. The operator then replaced finished piece with raw stock, tripped the start lever and the machine cycle repeated.

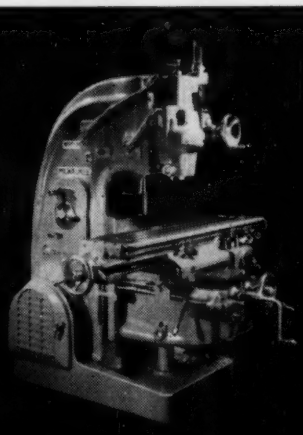
Example shown is a short-run job. On long runs, duplicate set-ups for reciprocal milling can be used, workpieces loaded and unloaded while cuts are being taken. Result: greater savings!

Equally important to you, Kearney & Trecker Automatic Cycle machines can be used as standard Knee-Types on single pieces and very short runs. For full information on these great new machines, write for Catalog AC10. Kearney & Trecker Corporation, Milwaukee 14, Wisconsin.

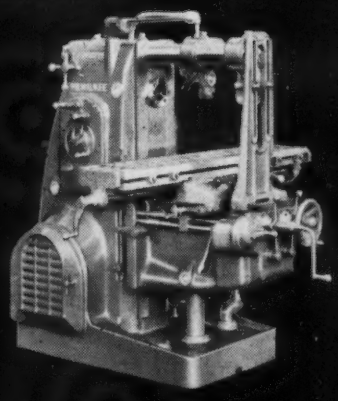


KEARNEY & TRECKER
MILWAUKEE
MACHINE TOOLS

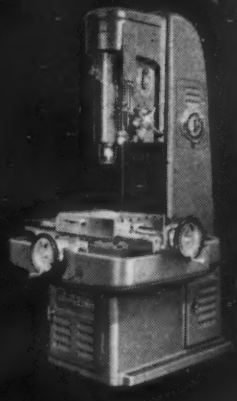
MODEL 3K VERTICAL AUTOMATIC CYCLE MILLING MACHINE—New Automatic Cycle feature gives you high production capacity on long run lots — and amazing new ease of control for short runs.

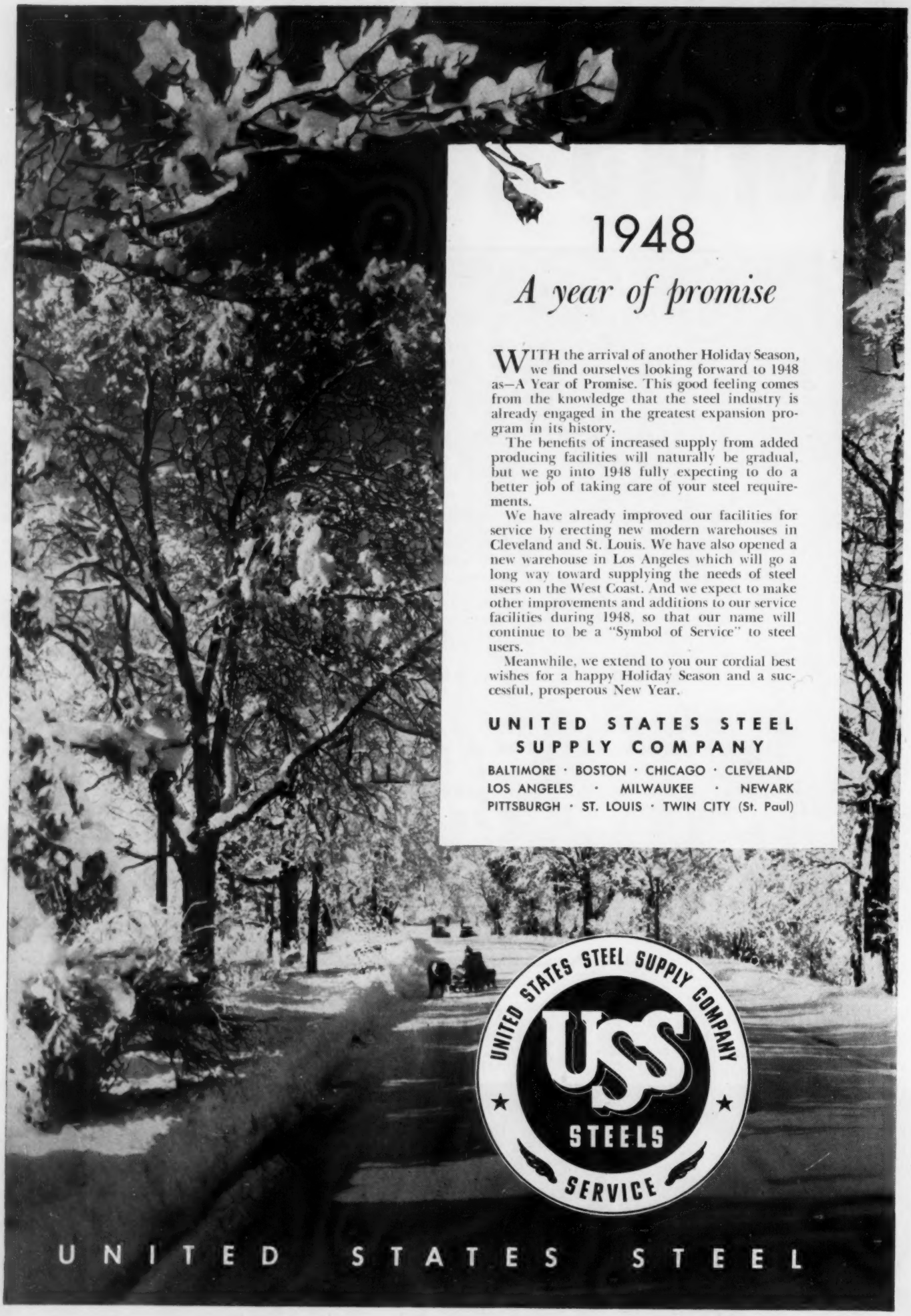


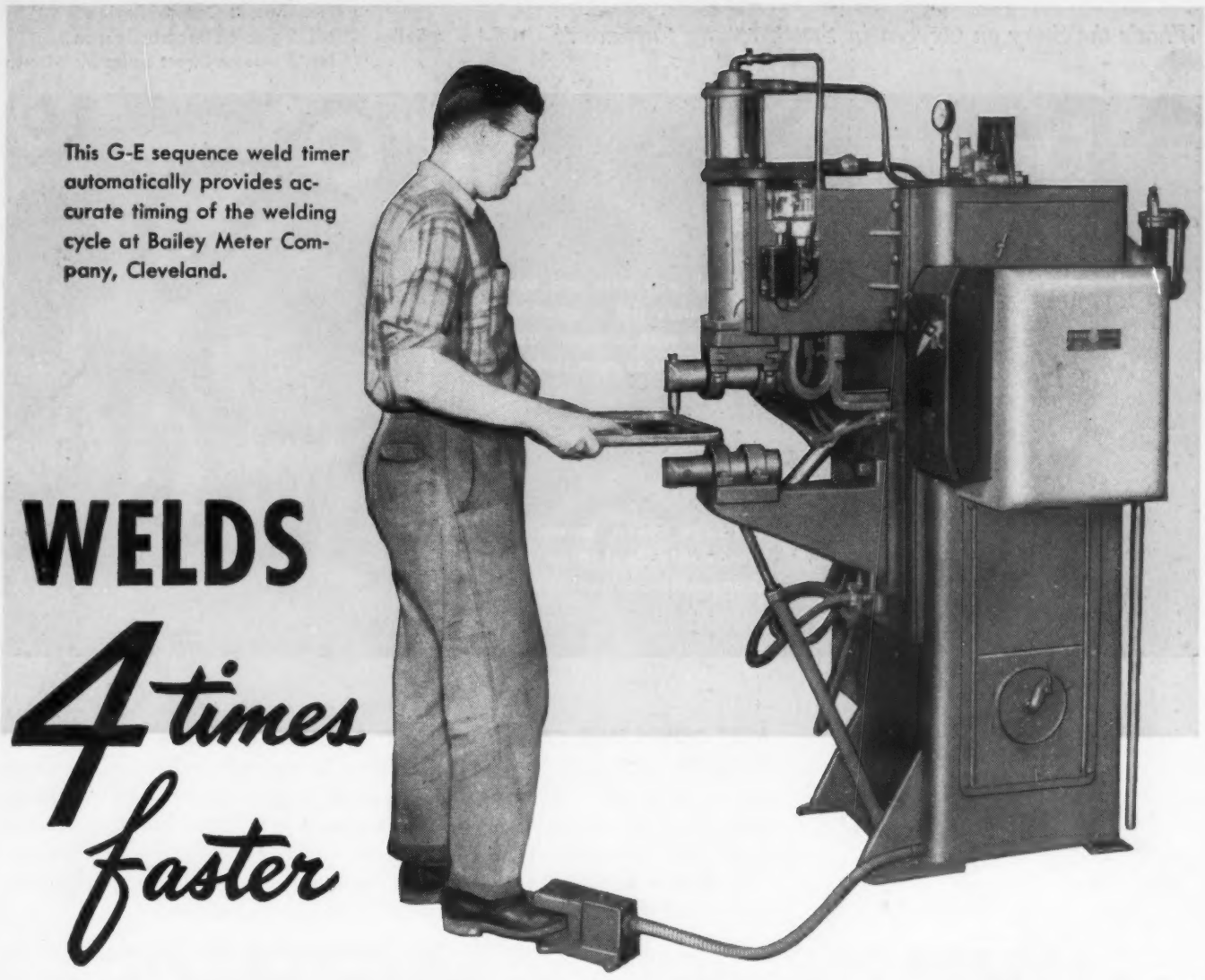
MODEL 2H PLAIN MILLING MACHINE—The most popular size machine ever built. Available in Plain, Universal and Vertical types. Automatic Cycle feature obtainable on either Plain or Vertical types.



MODEL 3C AUTOMETRIC PRECISION BORING MACHINE — Here is the result of nearly a half century of research in precision boring. Built to the most exact standards to produce the most exact results.




1948
A year of promise
WITH the arrival of another Holiday Season, we find ourselves looking forward to 1948 as—A Year of Promise. This good feeling comes from the knowledge that the steel industry is already engaged in the greatest expansion program in its history.
The benefits of increased supply from added producing facilities will naturally be gradual, but we go into 1948 fully expecting to do a better job of taking care of your steel requirements.
We have already improved our facilities for service by erecting new modern warehouses in Cleveland and St. Louis. We have also opened a new warehouse in Los Angeles which will go a long way toward supplying the needs of steel users on the West Coast. And we expect to make other improvements and additions to our service facilities during 1948, so that our name will continue to be a "Symbol of Service" to steel users.
Meanwhile, we extend to you our cordial best wishes for a happy Holiday Season and a successful, prosperous New Year.
UNITED STATES STEEL SUPPLY COMPANY
BALTIMORE · BOSTON · CHICAGO · CLEVELAND
LOS ANGELES · MILWAUKEE · NEWARK
PITTSBURGH · ST. LOUIS · TWIN CITY (St. Paul)
UNITED STATES STEEL SUPPLY COMPANY
USS
STEELS
SERVICE
UNITED STATES STEEL



This G-E sequence weld timer automatically provides accurate timing of the welding cycle at Bailey Meter Company, Cleveland.

WELDS *4 times faster* with G-E ELECTRONIC WELDING CONTROLS

Bailey Meter Company has increased its production rate of certain meter and automatic control parts 400 per cent with a new projection welding machine equipped with a G-E sequence weld timer and ignitron contactor.

With spot welding it took 18½ hours per 100 pieces; now, it takes 4½. G-E welding controls are responsible for a good share of this increase because they provide automatic and accurate timing of the welding cycle.

This timing eliminates the delay and operator error of the manual control on the foot-operated machine formerly used. And, it assures more consistent welding.

NOW, G-E CONTROLS ARE AVAILABLE IN ONE CABINET

General Electric now offers two new, improved lines of welding control—synchronous and non-synchronous. Each has all its components co-ordinated in one, attractive cabinet. Check these outstanding features:

1. **Control is factory-assembled, ready-to-install.**
2. **Easy servicing through large side door of cabinet.**
3. **Control station always faces operator.**

Investigate these and other features in Bulletins GEA-4699 and GEA-4726.

HAVE YOU SEEN "This Is Resistance Welding," G.E.'s full-color movie? It explains what resistance welding is, and where and how it has improved production.

Your nearest G-E office, local utility, or resistance welding machinery manufacturer representative will be glad to arrange a free showing for you.

General Electric Company, Sec. J 645-42
Schenectady 5, New York

Please send me the following resistance welding control bulletins:

- ☐ **GEA-4699 Synchronous Precision Control for Spot and Projection Welding**
- ☐ **GEA-4726 Nonsynchronous Control for Spot and Projection Welding**
- ☐ **GEA-4571 The Importance of Control**
- ☐ **GEA-3318B Sequence and Sequence Weld Timers**
- ☐ GEA-3058D Ignitron Contactors

Name .....

Company .....

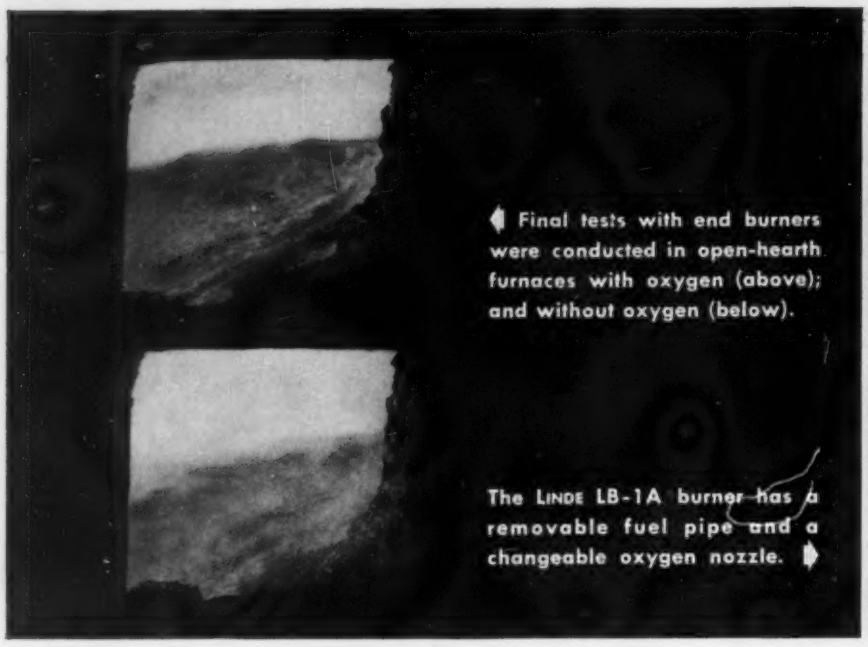
Address .....

GENERAL ELECTRIC

645-42

What's the Story on Oxygen in Steel-Making Furnaces? No. 4 of a Series

No. 1 was a General Review
No. 2 was on Decarburization
No. 3 was on Direct Scrap Melt-Down



Final tests with end burners were conducted in open-hearth furnaces with oxygen (above); and without oxygen (below).

The LINDE LB-1A burner has a removable fuel pipe and a changeable oxygen nozzle.

More Heat for Scrap Melting

MELT-DOWN TIME CAN BE REDUCED APPRECIABLY when oxygen is used in end-burner flames. This has been shown by the data on literally hundreds of the more than 7,500 heats on all phases of oxygen use in 34 furnace shops with which LINDE has co-operated. Increased heat input for scrap melting is obtained by introducing an oxygen stream beneath the fuel stream. Yet there is no increase in volume of combustion gases. This is particularly important in old furnaces with insufficient checker capacity.

LINDE burner developments have demonstrated the advantages of the undershot oxygen stream. This produces a much hotter flame than the conventional air-fuel burner. The oxygen-fuel flame is hottest on the underside. The upper part of the flame, near the roof, is no hotter than that produced by the conventional burner.

The design of the undershot burner is the result of many tests. Burners were designed to produce long thin flames and wide flat flames. Some were tested in full-size furnaces as end burners, others as auxiliary burners inserted through the back wall and roof.

Research on end burners is, of course, only one phase of LINDE's program. The goal is to find the most effective methods for using oxygen in steelmaking furnaces. Already this effort has resulted in a significant reduction in cubic feet of oxygen required per ton of steel to accomplish the desired production increase. In co-operation with steelmakers, LINDE will continue to explore all phases of oxygen use and report its findings as knowledge is gained.

Management and production executives are invited to write for a copy of the factual report which LINDE *has prepared on oxygen use in steel-making furnaces. This report also explains the* DRIOX *high-purity liquid oxygen system and* LINDE'S *work on low-purity gaseous oxygen. Please address Room 308, 30 East 42nd Street, New York 17, N. Y.*

Linde
Trade-Mark

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY, LIMITED, Toronto

The words "Linde" and "Driox" are registered trade-marks of The Linde Air Products Company.

Whether you make products

. . . as SMALL as this . . . or as LARGE as this . . .

. . . as LIGHT as this

. . . or as HEAVY as this

we have the WIRE to fit your needs !

IF your wire application is an "everyday" one, the chances are that you can find the right wire for your needs among our more than 400 different types of manufacturers wire. However, if you need a special analysis, grade or shape, we can take care of you just as easily. You can count on our excellent production facilities . . . unexcelled research equipment . . . our 100 years of quality wire-making experience to draw wire that will meet your requirements exactly. American Wire will provide trouble-free production and help insure the satisfactory performance of your product.

Our engineers will gladly help you to determine which American Quality Wire is best suited to your needs.

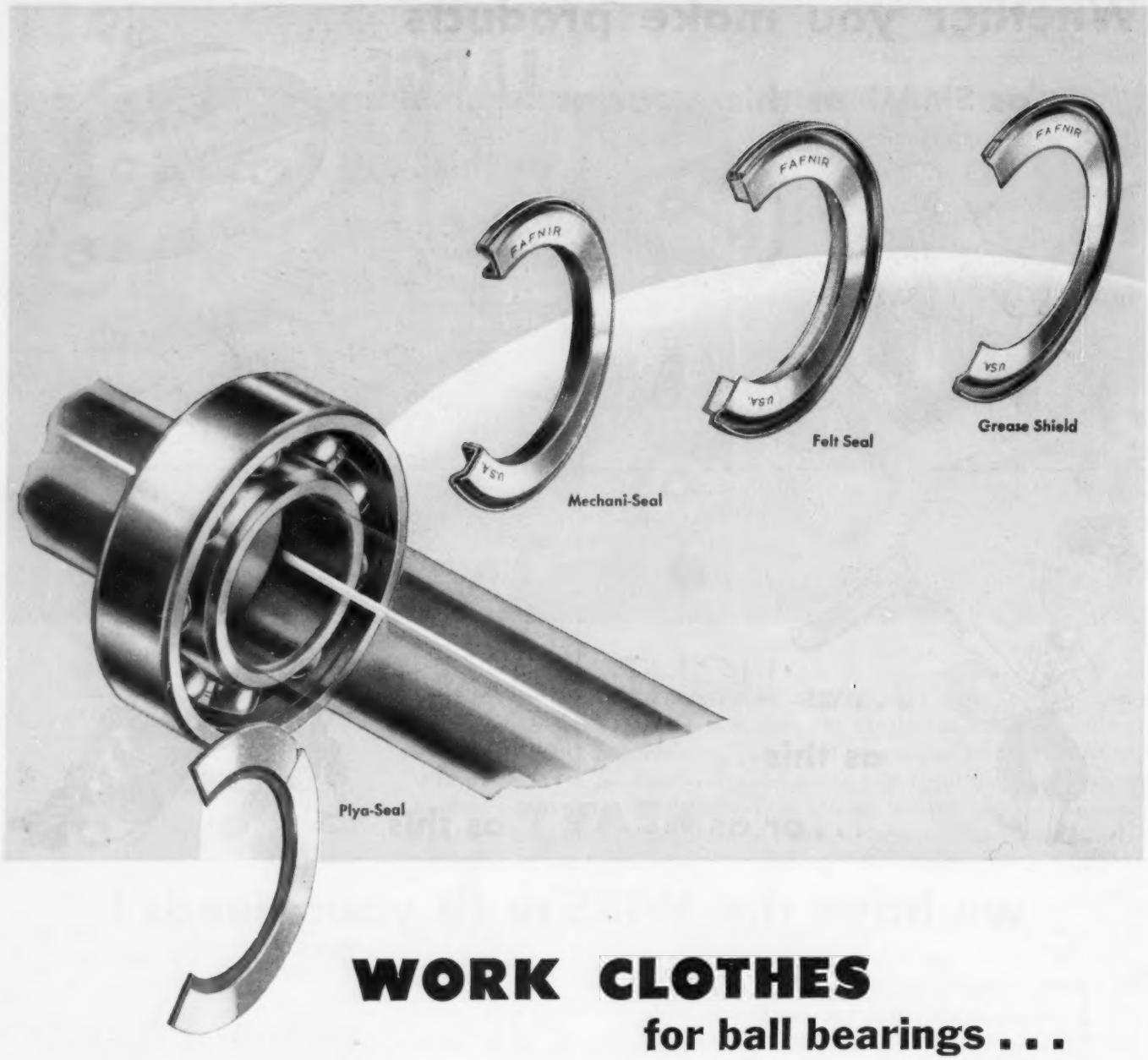
AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York
UNITED STATES STEEL

If you make it of wire . . . make it of the best

U·S·S AMERICAN

MANUFACTURERS WIRE

USS AMERICAN MANUFACTURERS WIRE UNITED STATES STEEL



WORK CLOTHES
for ball bearings . . .

HOW TO LEAVE a ball bearing unencumbered as a bathing beauty and yet protect it with work clothes snug-fitted to thousandths of an inch? This job of sealing or shielding a ball bearing is a double job of keeping lubricant in and contaminants out. More than a quarter century of Fafnir research and development have been devoted to this single factor of ball bearing design. The result . . . a whole wardrobe of tailor-made work clothes that wrap up a ball bearing like a cocoon yet allow it perfect freedom of action . . . for work in cement mills, face to face with corrosive fumes and live steam, buried in abrasive sand or up to its shoulders in muck and water.

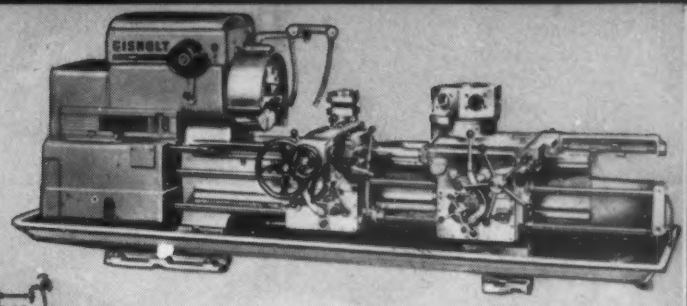
Some of these "wrap-ups" are simple as a work apron . . . just a precision-fitted single shield. Others are assemblies of felt rings and steel baffles. Another is an ingenious labyrinth of steel plates to foil either stray lubricant or contaminants. And the newest is a regular diving suit for complete sealing; yet it can be removed and replaced with a penknife.

None of which is half as interesting as the fact that the very first protective device for ball bearings was developed by Fafnir at the request of a manufacturer. It's Fafnir's readiness to work mind-to-mind with manufacturers that prompts so many developers of new products to think of Fafnir first. The Fafnir Bearing Company, New Britain, Connecticut.

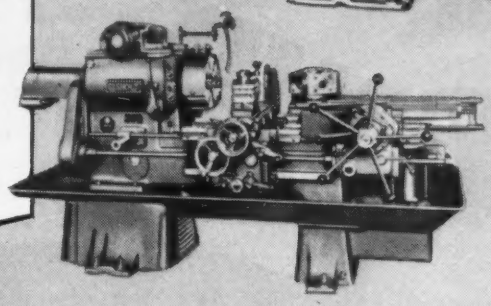
FAFNIR BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

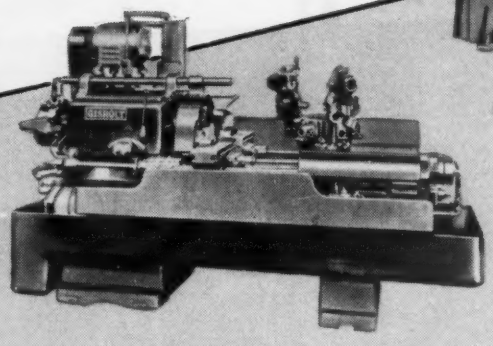
NEED HELP?



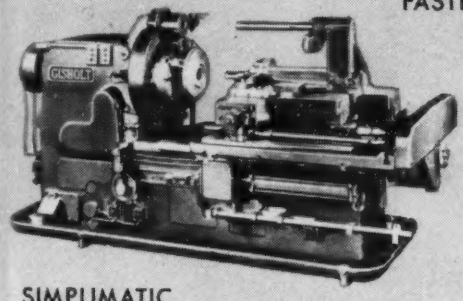
SADDLE TYPE TURRET LATHES



RAM TYPE TURRET LATHES



FASTERMATIC

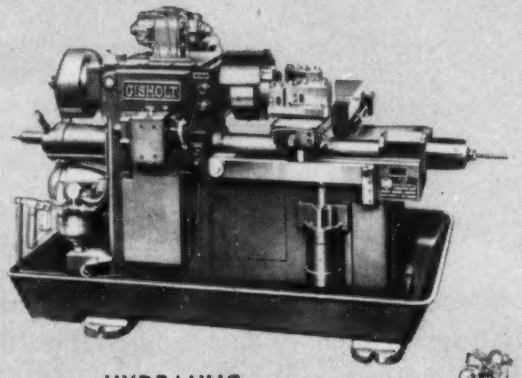


SIMPLIMATIC

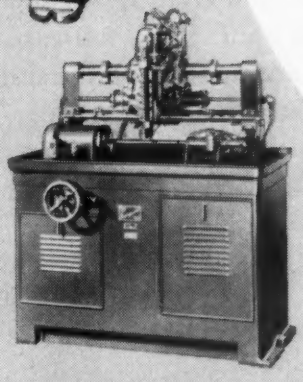
...in producing or refining ROUND PARTS?

Here, at Gisholt, is a group of men who specialize in the production—and refinement—of round and partly round parts. They have worked with thousands of shops—helped solve tens of thousands of problems during the past sixty years. Their extensive experience is yours for the asking.

unbiased judgment. The Gisholt line includes many sizes and types of Turret Lathes, Automatic Lathes, Superfinishers and Balancing Machines. Consequently, Gisholt engineers need never favor one machine over another excepting on the basis of how well it answers your particular problem. If they can't show you a way to save time and money, they will frankly tell you so.

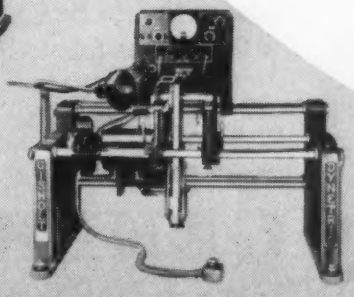


HYDRAULIC AUTOMATIC LATHES



SUPERFINISHERS

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface finishing, and balancing of round and partly round parts. Your problems are welcomed here.



BALANCERS

GISHOLT MACHINE COMPANY

Madison 3, Wisconsin

Look Ahead . . . Keep Ahead
. . . With Gisholt

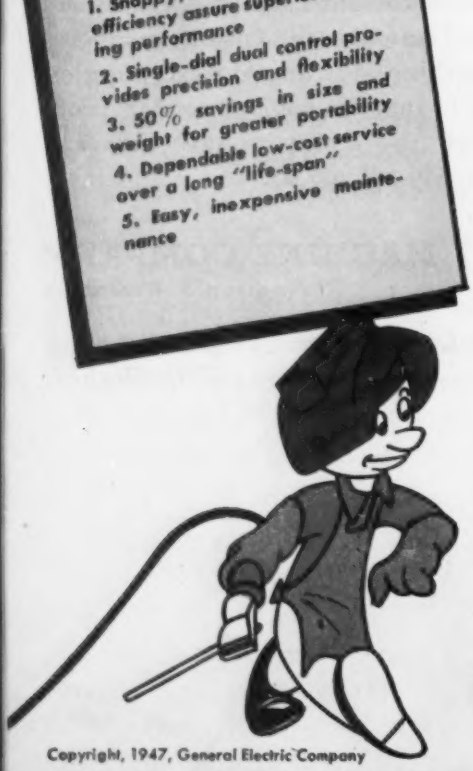
TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES • SUPERFINISHERS • SPECIAL MACHINES

FOR BETTER D-C WELDING

NEW WD-40 D-C WELDER

5 BIG FEATURES THAT MEAN EASIER, FASTER, LOWER-COST D-C WELDING

1. Snappy, stable arc and higher efficiency assure superior welding performance
2. Single-dial dual control provides precision and flexibility
3. 50% savings in size and weight for greater portability
4. Dependable low-cost service over a long "life-span"
5. Easy, inexpensive maintenance



• Outstanding welding performance and service is the hallmark of General Electric's new WD-40 series of heavy-duty industrial welders. Operating at 3500 rpm, these full-capacity NEMA-rated machines provide the same advantages of durability and minimized maintenance long associated with G-E welders; in addition, their welding performance is superior in many ways. The arc is easily struck and maintained, and steady welding current is provided over a broad current range.

Available in 200-, 300-, and 400-ampere ratings, the WD-40 line is described in detail in bulletin GEA-4852; ask your G-E Arc-welding Distributor for your copy.

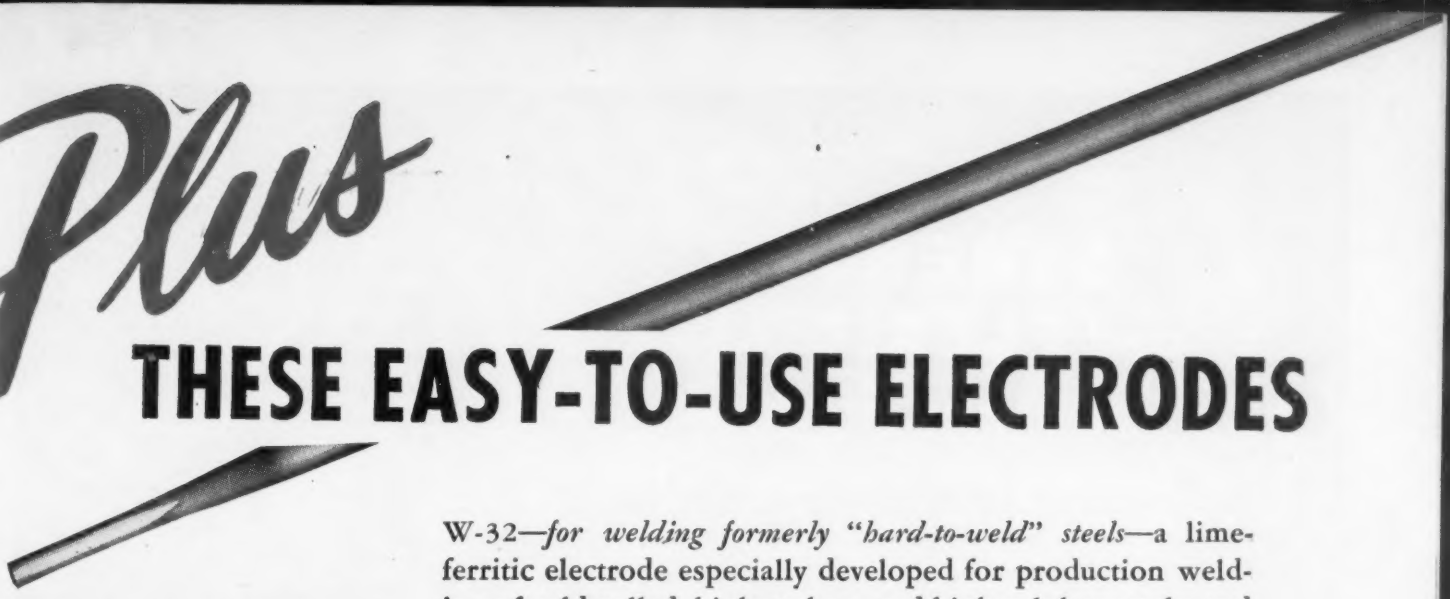
"A-C or D-C . . . there's G-E arc-welding equipment for virtually every application!"

GENERAL ELECTRIC

#73-70

Copyright, 1947, General Electric Company

Plus THESE EASY-TO-USE ELECTRODES



W-32—*for welding formerly "hard-to-weld" steels*—a lime-ferritic electrode especially developed for production welding of cold-rolled, high-carbon, and high-sulphur steels, and steels of high hardenability which are susceptible to underbead cracking. Stable arc characteristics provide good directional control.

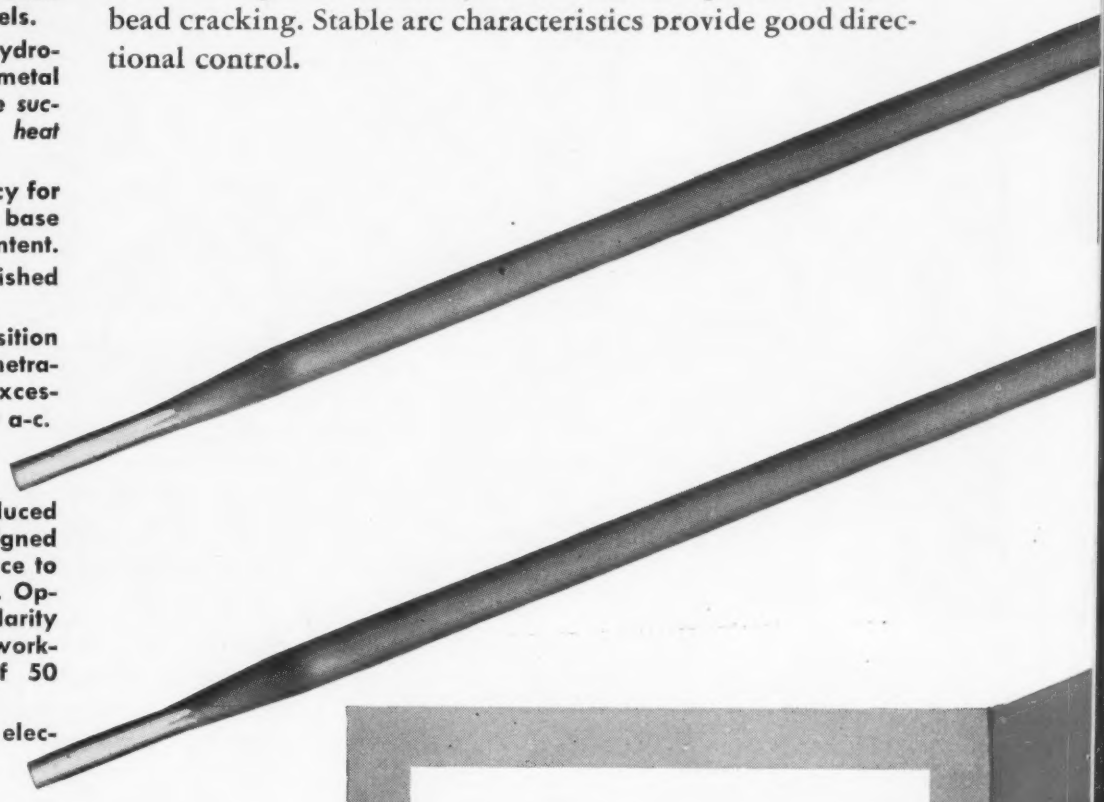
Other W-32 CHARACTERISTICS: Elimination of underbead cracking on hardenable steels.

Substantial reduction of hydrogen content of the weld metal produces welds that *can be successfully enameled without heat treatment.*

Marked decrease in tendency for surface holes to occur when base metal is high in sulphur content.

Excellent appearance of finished welds.

Spatter is minimized, deposition efficiency is high, and penetration is adequate but not excessive; reverse polarity d-c or a-c.



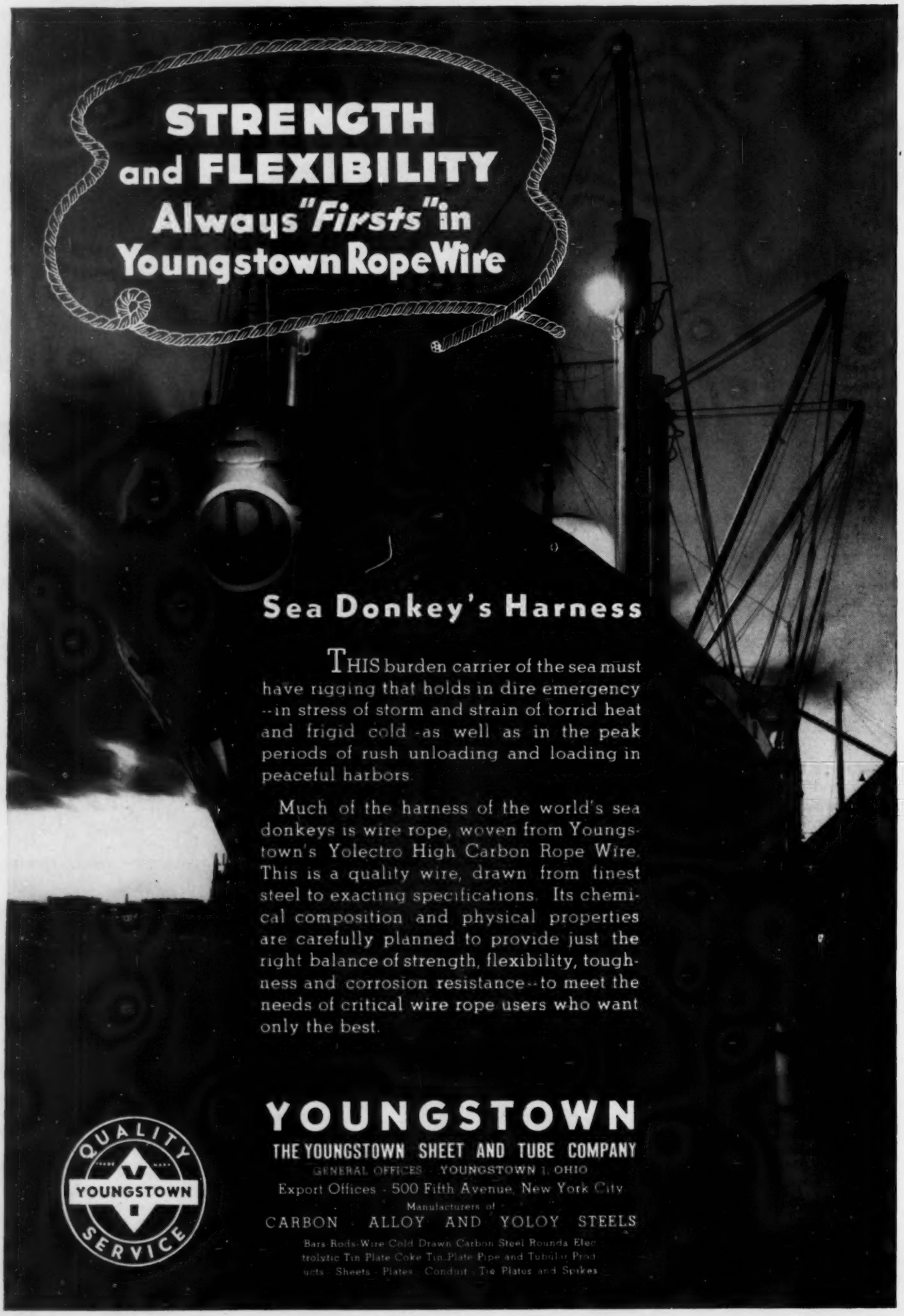
W-94—This recently introduced electrode is particularly designed to provide unusual resistance to shock and severe abrasion. Operating on either reverse polarity d-c, or a-c, its deposits will work-harden to a minimum of 50 Rockwell C scale.

Many other special-purpose electrodes are also available.

STAINLESS STEEL—Whatever your stainless application, you'll likely find an electrode to do the job better from among the complete G-E line of 27 types of stainless steel electrodes—available in two coatings, lime-type for d-c operation and titania-type for a-c or d-c.

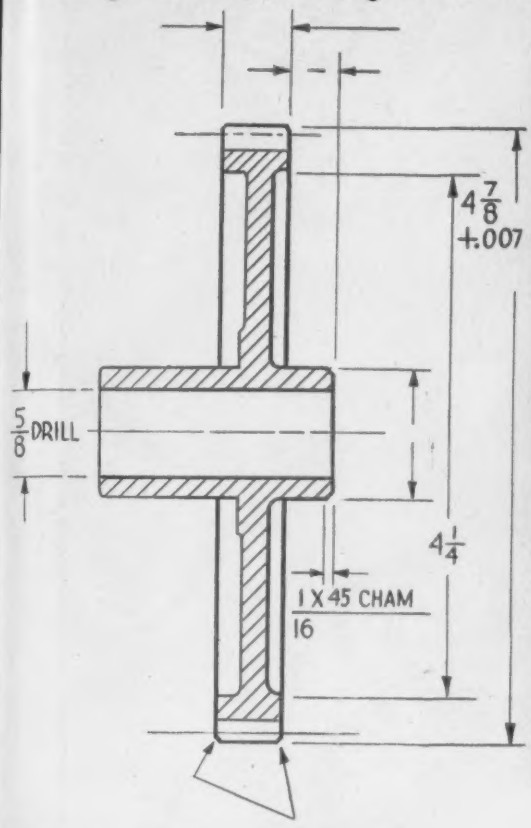
While comprising only a part of the complete line of General Electric arc-welding equipment, electrodes, and accessories, WD-40 welders and these electrodes are designed to provide *maximum performance* on those welding applications for which d-c is best suited. Call your *G-E Arc-welding Distributor* for a demonstration—of these, or anything else in the G-E welding line. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

ARC WELDERS . . . ELECTRODES . . . ACCESSORIES


STRENGTH
and FLEXIBILITY
Always "Firsts" in
Youngstown RopeWire
Sea Donkey's Harness
THIS burden carrier of the sea must have rigging that holds in dire emergency --in stress of storm and strain of torrid heat and frigid cold -as well as in the peak periods of rush unloading and loading in peaceful harbors.
Much of the harness of the world's sea donkeys is wire rope, woven from Youngstown's Yolectro High Carbon Rope Wire. This is a quality wire, drawn from finest steel to exacting specifications. Its chemical composition and physical properties are carefully planned to provide just the right balance of strength, flexibility, toughness and corrosion resistance--to meet the needs of critical wire rope users who want only the best.
QUALITY
YOUNGSTOWN
SERVICE
YOUNGSTOWN
THE YOUNGSTOWN SHEET AND TUBE COMPANY
GENERAL OFFICES · YOUNGSTOWN 1, OHIO
Export Offices · 500 Fifth Avenue, New York City
Manufacturers of
CARBON · ALLOY AND YOLOY STEELS
Bars-Rods-Wire-Cold Drawn Carbon Steel Rounds-Electrolytic Tin Plate-Coke Tin Plate-Pipe and Tubular Products · Sheets · Plates · Conduit · Tie Plates and Spikes

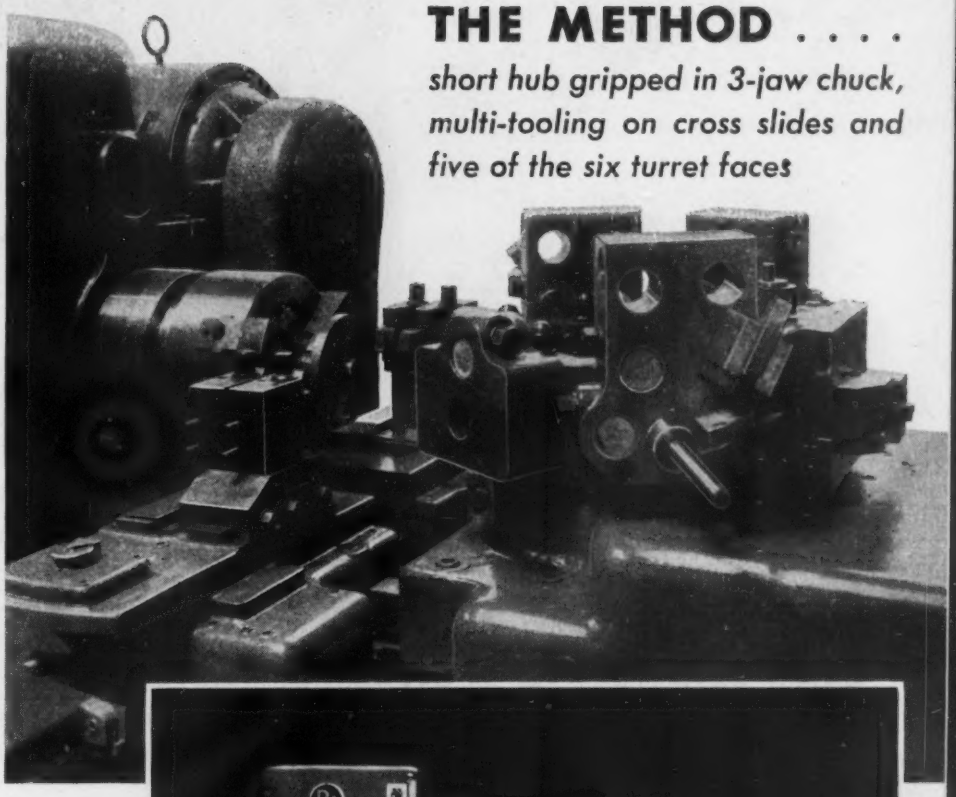
THE PART . . . .

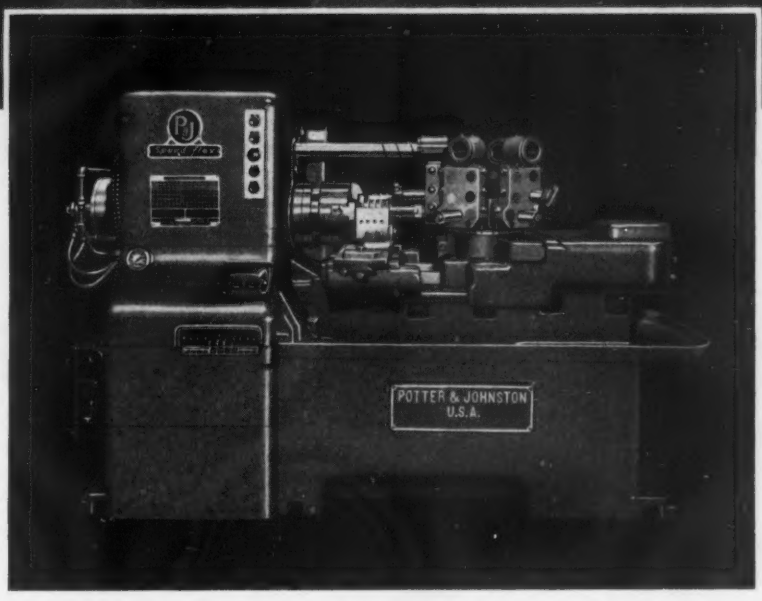
ebbed gear blank, close-grained cast iron



THE METHOD . . . .

short hub gripped in 3-jaw chuck, multi-tooling on cross slides and five of the six turret faces





THE MACHINE . . . .

3-U SPEED-FLEX

tooled by P & J production experts to utilize automatic functions so that one operator can handle three machines without physical or mental strain—thus cutting unit costs "to the bone"

Here is one of many prime examples of ability of this new Potter & Johnston Automatic Turret Lathe to "produce more and better things for more people at prices which more people can afford to pay." . .

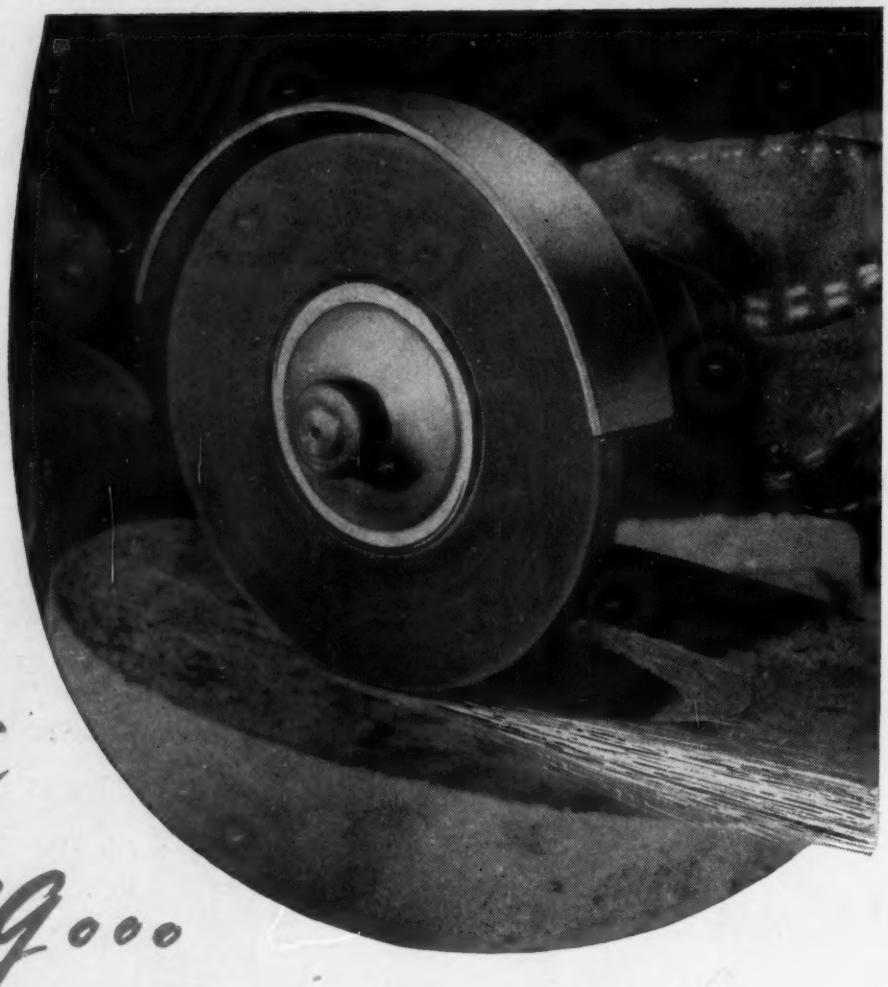
Through ingenuity and long experience of P & J machine designers, plus production "know-how" of P & J tool engineers, much of the mental responsibility and most of the physical effort involved in multi-operational repetitive machining of this 4⅞" diameter part (and innumerable other parts up to 6" in diameter), has been transferred from man to machine—from one man to three machines in this case.

Give us a chance to study your high cost parts involving drilling, boring, reaming, turning, facing, forming, etc. We will prove to you how 3-U SPEED-FLEX methods will bring those costs way down.

Total machining time	2 min. 19 sec.
Allowance for chucking	15 "
Average time per piece	2 " 34 "
Pieces per 51 min. hour per machine	22

And—with one operator easily handling three machines, 66 pieces per 51 min. hour!

POTTER & JOHNSTON MACHINE COMPANY
Pawtucket, Rhode Island



for high or low speed *portable grinding...*

use SIMONDS ABRASIVE WHEELS

For foundry and steel mill snagging... spot grinding... smoothing welds and grinding in hard-to-reach places, Simonds Abrasive Wheels hold their shapes to give cool cutting, long lasting action on high and low speed operations. Wheel shapes include straight and flaring type cup wheels, cones, pot balls and blind-end wheels in various sizes. Simonds Abrasive Resinoid Bonded Wheels are recommended for grinding speeds up to 9500 surface feet per minute... Vitrified Bonded Wheels for speeds up to 6500 surface feet per minute. Ask any Simonds Abrasive distributor for details on Simonds Abrasive Wheels for portable grinders or send for our Snagging Wheel Bulletin.

SIMONDS ABRASIVE COMPANY
is a division of
SIMONDS SAW AND STEEL CO.
Fitchburg, Mass.
Saws, Machine Knives, Files

Other Divisions:
SIMONDS STEEL MILLS
Lockport, N. Y.
Special Steels

SIMONDS CANADA SAW CO. LTD.
Montreal, Can.
Simonds Products for Canada

SIMONDS ABRASIVE CO.
PHILADELPHIA, PA.

SIMONDS ABRASIVE COMPANY, TACONY & FRALEY STREETS, PHILADELPHIA 37, PA.

Distributors in All Principal Cities

Easy to Read...

Easy to Write!

...nothing to convert or translate in these Direct VEEDER-READINGS

What you *see* is what you *get!*

Those figures in the counter-window give you (or your inspectors) a plain statement of production as it stands right now—in terms of strokes, turns, pieces or other units completed.

And those same figures, in other ways, can help your machine-operators, too—by enabling them, for instance, to pre-set depth of cut on a machine *in numerical thousandths,* instead of fussing around with dial-graduations. This saves important money in time and errors.

That's one reason why more and more designers are figuring out jobs for Veeder-Root Devices, *and then building them right into their machines.*

And no matter how *you* figure, you can count on Veeder-Root Devices for this:

Read 'em and reap! Yes, reap more benefits than you can even begin to imagine now. *Like to learn more?* Write.

VEEDER-ROOT
INCORPORATED
HARTFORD 2, CONNECTICUT

In Canada: Veeder-Root of Canada, Ltd., 955 St. James St., Montreal 3.

In England: Veeder-Root Ltd., Dickinson Works, 20 Purley Way, Croydon, Surrey.

There's a "Knack" to it . . .
this making of springs for mechanical things . . . keeping many orders in motion, some big, some small . . . using all kinds of materials . . . in all degrees of precision.
Toss your requirements to us . . . for plain production or engineering help. Special small automatics make short work of flat and coiled springs, small stampings and formed wire pieces.
The
WILLIAM D. GIBSON COMPANY
1800 Clybourn Ave., Chicago 14, Illinois
DIVISION OF ASSOCIATED SPRING CORP.
Smooth Working
GIBSON-SPRINGS

WHEN YOU BUILD OF ALUMINUM, FASTEN WITH ALUMINUM

AND AVOID TROUBLE

ALCOA ALUMINUM SCREWS, BOLTS, NUTS, RIVETS...

You get *all* the advantages of corrosion resistance, high strength and good appearance in products made of aluminum when you fasten them with Alcoa Aluminum Machine Screws (Phillips-head and slotted), Bolts and Rivets. You avoid unsightly rust stains. Don't have to paint and insulate the fasteners. Alcoa Aluminum Fasteners can be given the patented Alumilite finish that increases corrosion resistance, improves appearance, and permits color selection.

There's a *complete line* of Alcoa Aluminum fastening devices . . . types, sizes, and styles of bolts, screws, rivets, and nuts to meet your needs. They all have high strength-weight ratios, are made of strong aluminum alloys to withstand tightening pressures, torsion, and vibration.

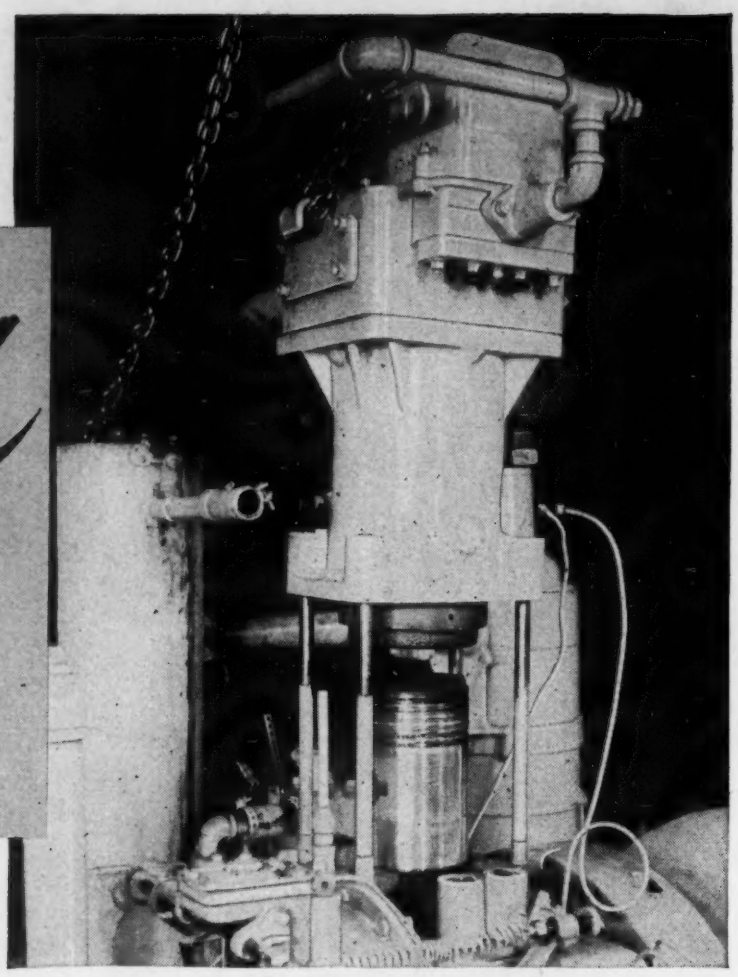
When you order the Alcoa Aluminum for a job, order the Alcoa Aluminum Fasteners to assemble it. Your nearby Alcoa distributor has complete stocks of Alcoa Rivets, Nuts, Bolts, Screws, and Washers. Or write to ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh 19, Pennsylvania. Sales offices in 55 leading cities.

MORE PEOPLE WANT MORE ALUMINUM FOR MORE USES THAN EVER

ALCOA FIRST IN **ALUMINUM**

IN EVERY COMMERCIAL FORM

Clean ... FROM EAST CHICAGO



At Sinclair Research Laboratories, East Chicago, Ind., skilled technicians specialize in keeping it clean ... for you.

With today's accent on the detergency qualities of engine lubricants, Sinclair Research is constantly making tests to determine the cleansing properties of motor oils, diesel lubricants, and other products, using the special "come-apart" single cylinder diesel engine shown above.

Such tests—duplicating actual operating conditions—constitute an essential part of Sinclair's outstanding research, which has resulted in the development of ever finer petroleum products for over 30 years. At its soon-to-be-completed new Research Center, Harvey, Ill., Sinclair will continue to develop industrial and automotive lubricants of outstanding performance with greater facilities, finer equipment, and more highly skilled personnel than ever before.

Sinclair Metal Cutting Oils

(Embodying Film Strength Characteristics)

ORDNANCE OILS

Permit deeper cuts at higher speeds

SINCLAIR REFINING COMPANY • 630 FIFTH AVENUE, NEW YORK 20, N. Y.

SINCLAIR

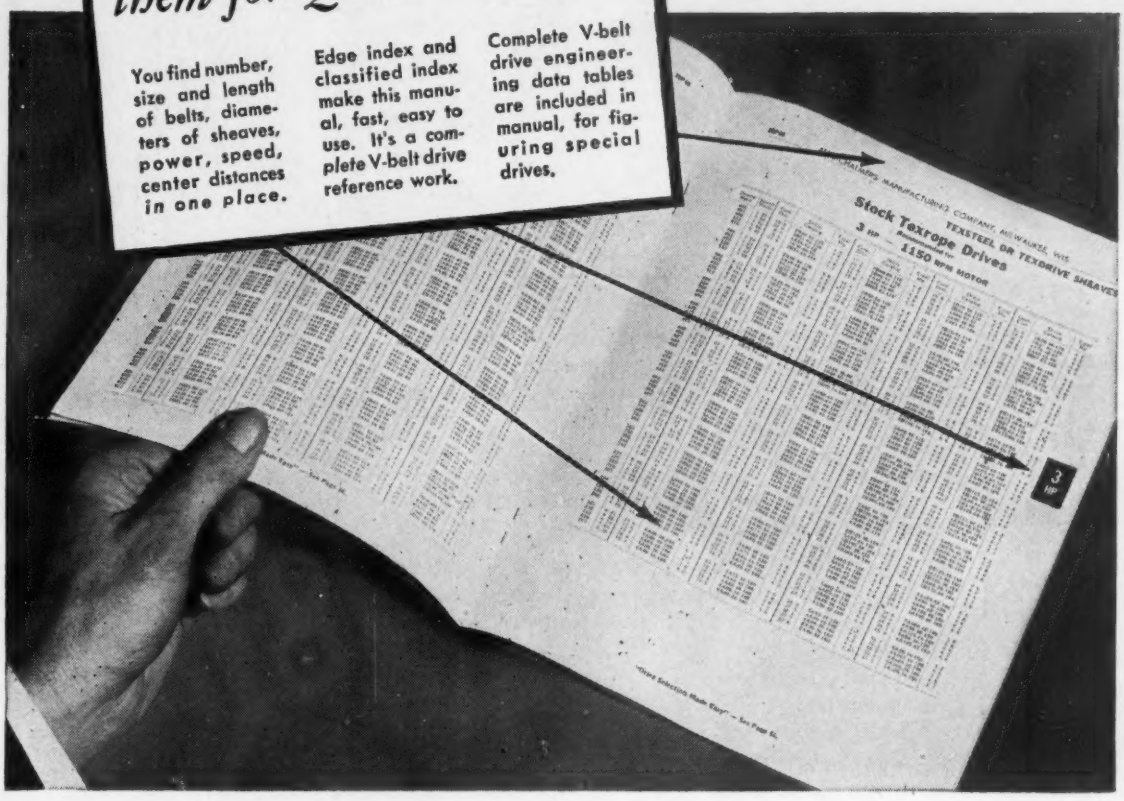
Lubricants for Industry

FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

90% OF ALL V-BELT DRIVE PROBLEMS SOLVED ECONOMICALLY WITH TEXROPE

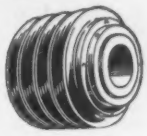
Pre-Engineered Drives

TEXROPE ..Greatest Name in V-Belt Drives

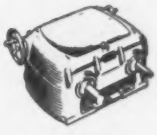

This New Manual Lists them for Quick Reference
You find number, size and length of belts, diameters of sheaves, power, speed, center distances in one place.
Edge index and classified index make this manual, fast, easy to use. It's a complete V-belt drive reference work.
Complete V-belt drive engineering data tables are included in manual, for figuring special drives.
Stock Texrope Drives
TEXSTEEL OR TEXDRIVE SHEAVES
3 HP
1150 RPM MOTOR

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.



"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.



SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

USING STOCK BELTS AND SHEAVES, Texrope engineers have selected the *best* drive for each requirement . . . the drive most economical in first cost and in maintenance.

Only Allis-Chalmers offers you this complete Pre-Engineered drive manual. It is the product of 23 years of industrial V-belt drive experience, the finest engineering talent in the business.

Here is a book that will save you time and money in the purchase of V-belt drive equipment. Copies have been sent to many Texrope users and dealers. If you don't have a copy yet, write for Texbook No. 20P40. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2335

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

Texrope, Super-7, Texsteel, Texdrive, Magic-Grip and Vari-Pitch are Allis-Chalmers Trademarks

ALLIS-CHALMERS

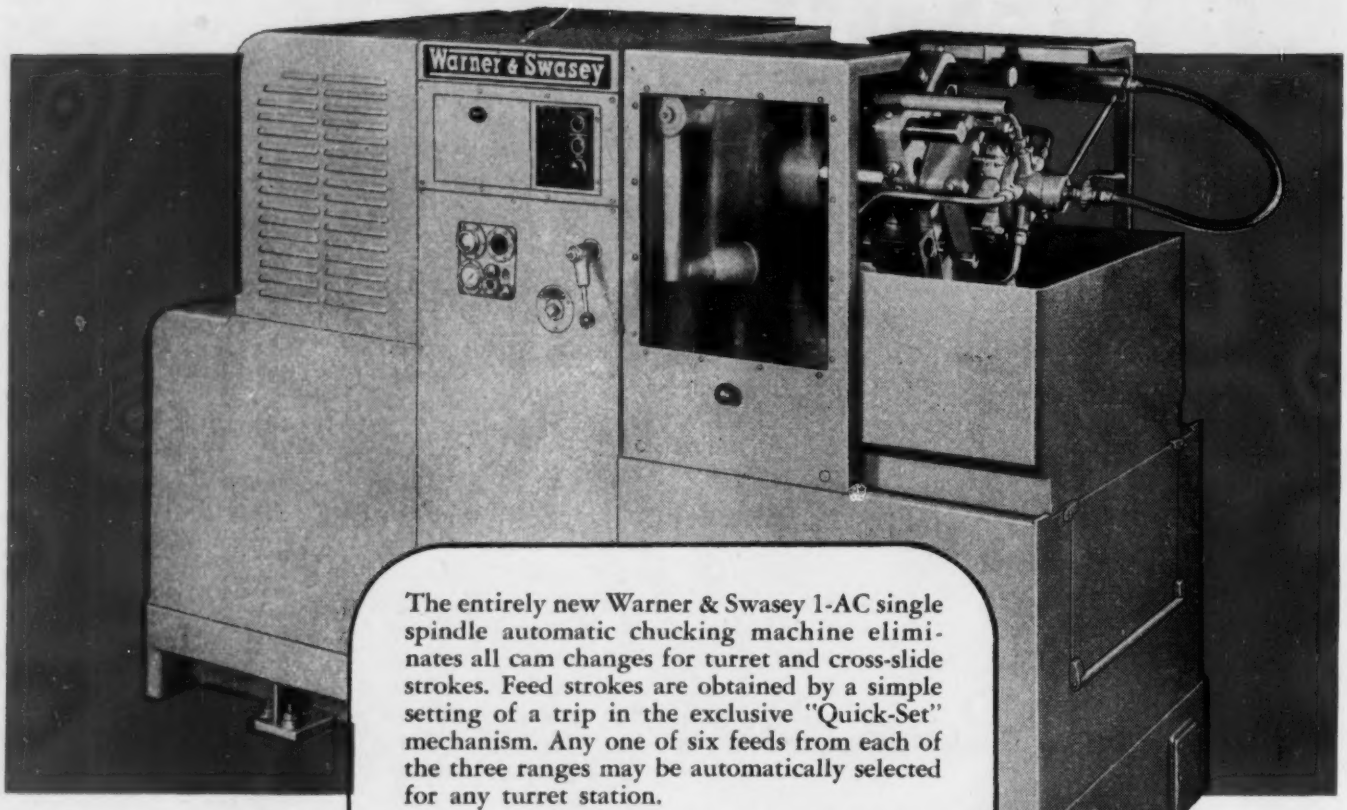
One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947 A CENTURY OF SERVICE to Industry THAT MADE America Great

No Cam Changes on this New

Single Spindle Automatic

by WARNER & SWASEY



The entirely new Warner & Swasey 1-AC single spindle automatic chucking machine eliminates all cam changes for turret and cross-slide strokes. Feed strokes are obtained by a simple setting of a trip in the exclusive "Quick-Set" mechanism. Any one of six feeds from each of the three ranges may be automatically selected for any turret station.

Front or rear cross-slide, or both, can be operated on any turret face, or while the turret is dwelling. Other of the many outstanding features are: eight ranges of four automatically selected speeds; shockless turret indexing for maintaining original accuracy; skip-indexing of turret to eliminate unnecessary approach strokes; maximum rigidity, simplicity of setup, and many new operator conveniences.

8" or 10" Chuck • 6" Turning Length

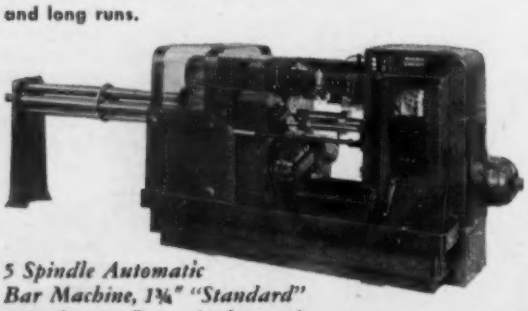
OTHER AUTOMATICS

now built by Warner & Swasey include 5 spindle Bar and Chucking Machines which feature the exclusive, patented "Quick-Set Mechanism". *This eliminates need for cams.* Work stroke settings are made by quick, simple adjustment on a graduated quadrant. The fast changeover makes it practical and profitable to use Warner & Swasey Automatics for small, medium and long runs.

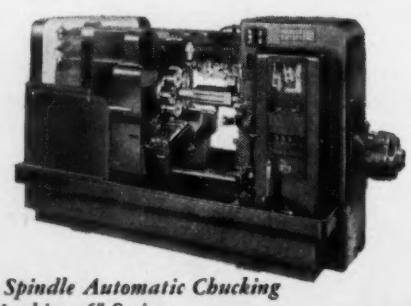
To get full, up to the minute information on the latest developments in Warner & Swasey

TURRET LATHES
AUTOMATIC CHUCKING AND BAR MACHINES
PRECISION TAPPING AND THREADING MACHINES
CHUCKS AND TURNING TOOLS AND ACCESSORIES

call in the Warner & Swasey field representative or write Warner & Swasey, Cleveland.



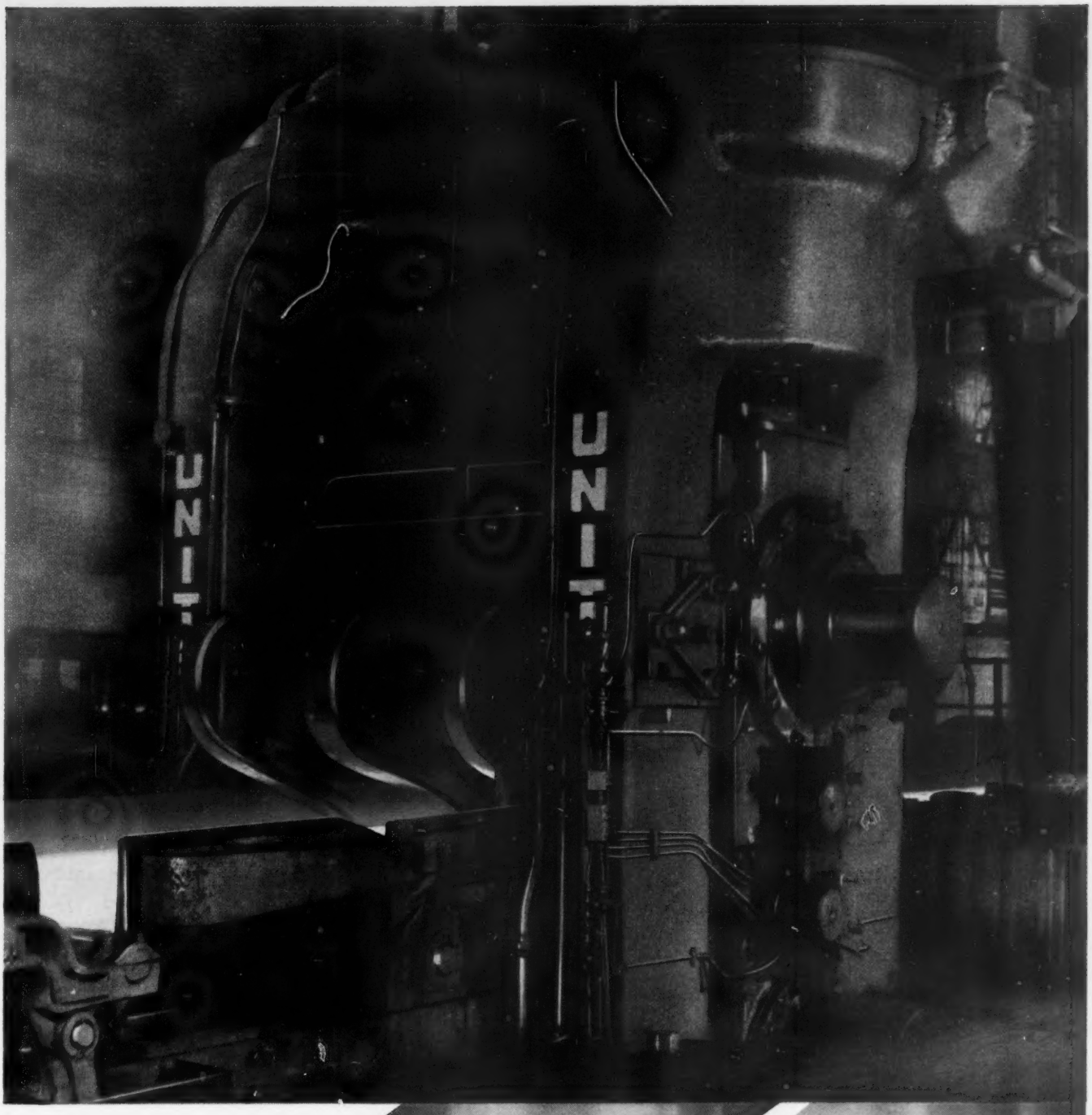
5 Spindle Automatic Bar Machine, 1¼" "Standard" capacity; 2¼" oversized capacity.



5 Spindle Automatic Chucking Machine, 6" Swing.

WARNER & SWASEY
Machine Tools
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY



UNITED....

FINISHING STAND, 4-HIGH

HOT STRIP MILL

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

PLANTS AT PITTSBURGH·VANDERGRIFT·NEW CASTLE
YOUNGSTOWN·CANTON

Subsidiary: Adamson United Company, Akron, Ohio

Affiliates:
Davy and United Engineering Company, Ltd., Sheffield, England
Dominion Engineering Works, Ltd., Montreal, P. Q. Canada

REG. T.M.

Sheffield quality assures low cost *Gage Performance*

the *Sheffield* corporation

Dayton 1, Ohio — **U. S. A.**

Sheffield MASTER CRAFTSMEN

{ Standard Gages Shipped in 24 Hours }

2584

EDITORIAL STAFF

E. L. SHANER
Editor-in-Chief

IRWIN H. SUCH
Editor

WM. M. ROONEY
News and Markets Editor

J. D. KNOX
Steel Plant Editor

GUY HUBBARD
Machine Tool Editor

DON S. CADOT
Art Editor

ALLEN G. GRAY
Consulting Editor

ASSOCIATE EDITORS

W. J. CAMPBELL • F. R. BRIGGS
JAY DEEULIS • VANCE BELL
WALTER F. TOERGE • DAN REEBEL

ASSISTANT EDITORS

H. C. TUTTLE • DOLORES K. BLAHA
HENRY J. HOLTZ • L. J. SKUDERIN
JOHN S. MORGAN • M. T. BORGERHOFF

RESIDENT EDITORS

E. C. KREUTZBERG
Washington Editor

B. K. PRICE
Eastern Editor, New York

L. E. BROWNE
Associate Editor, New York

E. F. ROSS
Chicago Editor

J. C. SULLIVAN
Pittsburgh Editor

A. H. ALLEN
Detroit Editor

VINCENT DELPORT
European Editor, London

EDITORIAL CORRESPONDENTS

R. W. KINCEY, *Birmingham*
L. C. FELDMANN, *Buffalo*
SAMUEL S. CARR, *Cincinnati*
MAC HUTCHENS, *St. Louis*
GEORGE R. REISS, *Youngstown*
MAURICE BEAM, *Los Angeles*
ROBERT BOTTORFF, *San Francisco*
R. C. HILL, *Seattle*
C. K. CATES, *Dallas*
F. S. TOBIN, *Toronto*
J. A. HORTON, *Birmingham, Eng.*
LEON JAUDOIN, *Paris, France*
JACQUES FOULON, *Liege, Belgium*

MAIN OFFICE

Penton Building, Cleveland 13, Ohio

BRANCH OFFICES

New York 17 .....16 East 43rd St.
Chicago 11 .....520 North Michigan Ave.
Pittsburgh 19 .....2806 Koppers Bldg.
Detroit 2 .....6560 Cass Ave.
Washington 4 .....956 National Press Bldg.
Los Angeles 4 ....130 N. New Hampshire Ave.
London ....2 Caxton St., Westminster, S.W. 1

Business Staff on Page 4

NEXT WEEK . . .

Draft Gears from Rolled Steel

Antifriction Bearings

High Temperature Alloy Welding

Alloy Control by Spectrograph

Mechanized Scarfing

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 25 DECEMBER 22, 1947

NEWS

★ As the Editor Views the News 29
★ News Summary 33
Metallics Shortages Pinch Foundries 34
Mobilization Plan Takes Form 36
Steel Mill Equipment Scarce 37
Control Bills Carried Over to January 38
Navy's Sheet Steel Needs Met 38
Steel Traffic Change Hinted 39
Electric Goods Pricing Changed 40
★ Present, Past and Pending 40
Cold Metal's Steckel Patent Claims Upheld 41
Building 2000-Ton Cyclotron Magnet 41
★ Windows of Washington 42
British Defer Reconstruction 45
German Removals Too Drastic? 45
Radio Production Setting New Record 46
★ Mirrors of Motordom 49
Coast Industry Taking Price Hedge Action 52
★ Briefs 53
★ The Business Trend 54
★ Men of Industry 56
★ Obituaries 60
★ Construction and Enterprise 124

TECHNICAL

★ Engineering News at a Glance 61
Latest Metalworking Equipment Employed in New Truck Plant 63
Seam Welding Composite Plates 64
Selecting Aluminum Alloys for Specific Applications 67
Fabricating Steel Hardware 71
★ Progress in Steelmaking—Evaluating Steel Cleanliness 74
★ New Products and Equipment 91
★ Helpful Literature 99

MARKETS

★ Market Summary 101
★ Market Prices and Composites 102
Congress To Act on Mining Subsidies in January 106

★ *Index to Advertisers* 132

★—Denotes regular features

It's Gotta Fit...

DEPENDABLE DAN
Our Customers' Man

TURN IN MORE SCRAP — HELP TURN OUT MORE STEEL

IT MUST FIT YOUR JOB

RELIANCE

JOB-FITTED STEEL

Best fitted to do a specific job for a specific customer at a specific time — and all factors considered, at lowest cost.

PRODUCTS
•
SHEETS
Hot Rolled
Hot Rolled Pickled
Cold Rolled
Long Terne
Galvanized
•
PLATES
•
COLD ROLLED STRIP STEEL
Coils and Cut Lengths, Slit or Round Edge
All Tempers
•
ALUMINUM*
Sheets and Strip

RELIANCE STEEL DIVISION

Detroit Steel Corporation

GENERAL OFFICES: 1025 SOUTH OAKWOOD AVE., DETROIT 9, MICH.

PLANTS: CHICAGO*, CLEVELAND*, DETROIT*, LYNDHURST, N. J., WORCESTER, MASS.

SALES OFFICES: GRAND RAPIDS,* INDIANAPOLIS*, NEW HAVEN, PHILADELPHIA, ST. LOUIS,* TOLEDO*

ALUMINUM SHEETS and STRIP—available through locations marked

December 22, 1947

Creative Ingenuity

Seldom has the old adage that necessity is the mother of invention been so convincingly demonstrated as during the current period of steel shortage. Producers, distributors and consumers are in a lively struggle to find ways to solve the unusual problems of procurement. The result is an almost unprecedented display of ingenuity and resourcefulness.

Some consumers have obtained a reliable source of steel supply by the simple process of purchasing a steel company. Others have achieved a similar result by negotiating intricate deals involving scrap, semifinished steel and finished steel products. Still others have managed to get by fairly well by the hard way of hounding suppliers unmercifully and by rounding out scant receipts with an occasional dip into gray markets.

Obviously these expedients are not of equal merit. The consumer who purchases a mill solves his own procurement problem, but in doing so he removes a source of tonnage from the open market. He gains at the expense of other consumers. The same can be said about most of the trade deals and of gray market purchases. Ingenuity which profits one company while making things worse for all other companies does not help the national situation. On the contrary, it aggravates it.

Fortunately, there is a kind of ingenuity which can help the individual company without harming others. During the past few weeks a few cases in this category have come to light. One is the purchase of a million tons of scrap from China by Bethlehem Steel Co. Another is the leasing of two-thirds of the former Shenango tin plate plant of Carnegie-Illinois Steel Corp. at New Castle, Pa., by Hudson Motor Car Co.

These deals have the common merit of serving their principals' objectives without hurting other companies and of adding to instead of subtracting from the nation's tonnage of the materials involved. Bethlehem's $30 million purchase relieves by the considerable magnitude of a million tons the present pressure on domestic sources of scrap. Hudson's attempt to operate old hand mills, aside from the problem of procuring sheet bars in a tight market, inflicts no new burdens upon the hard-pressed national economy.

We need more of this kind of creative ingenuity.

* * *

FAR FROM INEVITABLE: According to the latest Civil Service report, there were 2,024,226 employees on the payroll of the federal government last Oct. 31. This represents a net gain of 2626 for the month of October and marks the first time in 17 months that federal employment has increased.

This reversal in trend is disturbing. More disturbing, however, is the complacency with which most people in Washington regard it. Our reporter states that a general-held view in Washington is that "the period of shrinking government payrolls has reached its end and that from now on the number of federal employees will increase."

No doubt this is an accurate appraisal of Washington opinion, which obviously is colored by the proximity of Washingtonians to federal bureaucracy, but we doubt seriously whether this opinion is shared by more than a small minority of the American public at large.

The sad explanation is that after 14 years of one emergency after another, it has become almost impossible to view justifiable federal gov-

(OVER)

ernment activities in proper perspective. We have become so accustomed to undertaking government services on flimsy, fleeting or questionable pretext that we have almost lost track of what the fundamental functions of government should be.

Instead of thoughtlessly accepting an ever-increasing federal payroll as inevitable, our representatives in Washington should be trying to regain a sensible idea as to what federal activities are desirable from the standpoint of national well-being. —p. 42

* * *

INFLATION ANTIDOTE: Last week, just before holiday and year-end interruptions became effective, industrial production was going along at a miraculous pace. Many production indices were at peacetime highs and work stoppages because of strikes or other cause were at a minimum. Output was phenomenal, considering the supply of materials and the over-strain on equipment.

It will be well to keep this picture of unbelievable production in spite of difficulties in mind when considering controls in connection with the Marshall Plan. If we go beyond the simplest of allocations, we will immediately impose restrictions which will cut this miraculous production by 25 per cent or more.

The smooth-running, high-output we have been witnessing in recent weeks is the best anti-inflation medicine that can be prescribed for this nation. It would be foolish to discard it to satisfy the whims of theorists and experimenters. —pp. 38, 54, 101

* * *

CO-ORDINATED TRANSIT: At a hearing of the Interstate Commerce Commission at Boston, a general traffic manager of subsidiaries of United States Steel Corp. testified that undue increases in railroad freight rates might divert considerable traffic from rails to other forms of transportation.

He stated that during the first nine months of 1947 the six major steel producing subsidiaries of United States Steel moved by truck more than 6 per cent of their total shipments of finished steel. "Other steel companies," he declared, "have stated that they ship a much higher proportion of their finished products by truck."

This point should not be dismissed lightly. Inducements to ship by motor truck or by water have been mounting steadily for several decades. Yet in emergencies, as in the recent war, it is the railroads which are called upon to carry the chief burden of transportation. Sometimes we wonder what would happen if all carriers—rail, truck, water, air and pipeline—were free to offer the services they think the nation's shippers want, regardless of moss-grown ICC restrictions. The answer might be a streamlined, co-ordinated national transportation system. —p. 39

* * *

SPURT IN TELEVISION: Output of radio receivers during the first 10 months of 1947 totaled 14,374,218 sets and for the year will approximate 16 million. This is a new record.

The outlook for 1948 is complicated by the fact that supply is rapidly catching up with demand and that the market for television sets is relatively new and untested. The consensus of opinion among radio equipment manufacturers is that the total number of sets will drop in 1948, but that the number of television instruments will increase sharply.

About 150,000 television sets will be produced in 1947. Manufacturers expect an output of at least 400,000 in 1948 and of a million annually by 1950. Industry may be well advised to watch television closely. It has the potential of becoming an important factor in mass production during the next few years. —p. 46

* * *

GOOD WILL TOWARD MEN: Not long ago a writer discussing world affairs said that the Soviet Union was more interested in failure of the Marshall Plan and of capitalism than in the success of communism.

Perhaps this is symbolic of the attitude of ill will that is so prevalent throughout the world today. Internationally, nationally and locally there are persons more intent upon visiting disaster upon others than upon achieving happiness for themselves. It is a curious and lamentable aftermath of a world disordered by the madness of Hitler and others.

With Christmas so near at hand, would that men and women everywhere—and particularly those in high places—could discard hate and suspicion and again conduct themselves according to the precept of "good will toward men."

Merry Christmas!

E. L. Shaner

EDITOR-IN-CHIEF

Here's Coast-to-Coast Service on Alloys

When you contact a Ryerson Plant for alloy steel, you're actually contacting all twelve plants in the Ryerson Steel-Service system. That means when the alloy you need is temporarily out of stock at the point of purchase, the huge stocks of eleven other Ryerson Plants are promptly checked to find the steel that meets your requirements. And it means that vast and varied Ryerson alloy stocks are within easy reach, no matter where you are in America.

In addition, the Ryerson system of alloy service enables you to purchase alloys the safe way—by *hardenability*. You can buy on the basis of desired performance requirements, thus minimizing the possibility of failure in finished parts and products.

To make heat treating easier, Ryerson also furnishes a complete alloy report that enables you to obtain accurate results without experimenting or costly re-treating. The report includes: Chemical analysis, results of hardenability test, physical properties as interpreted from test results, and recommended working temperatures for every heat in the shipment.

This complete alloy service is always available from all twelve Ryerson plants. Write, wire or call the nearest plant when you need steel.

Joseph T. Ryerson & Son, Inc. Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles.

PRINCIPAL PRODUCTS

Bars— hot and cold rolled reinforcing Structurals Plates— Inlard 4-Way Floor Plate	Mechanical Tubing Boiler Tubes and Fittings Allegheny Stainless— sheets, plates, shapes, bars, tubing, etc. Sheets and Strip Steel	Tool Steel Wire, Chain Bolts, Rivets Babbitt Metal Working Tools & Machinery, etc.

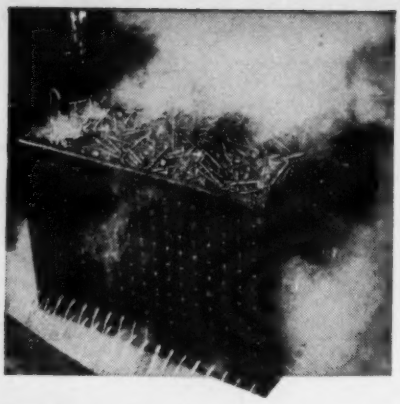
RYERSON STEEL

SHEET • BAR • ROD • FLAT • ANGLE • HALF-ROUND • HEX • WIRE • ROUND • SHEET •

How shall I Use Monel To Make the Best Pickling Basket?

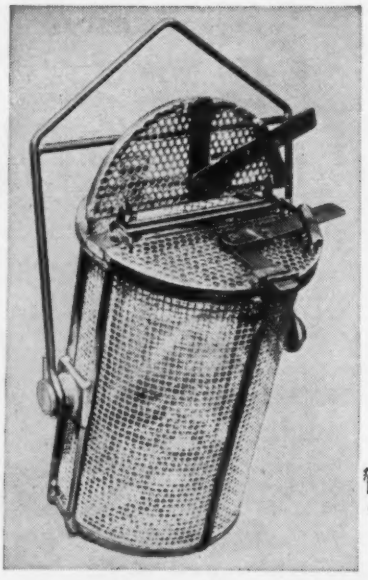
There are as many answers as there are standard mill forms of Monel COME ALONG AND SEE WHY . . . .*

SHEET • BAR • ROD • FLAT • ANGLE • HALF-ROUND • HEX • WIRE • ROUND • SHEET •

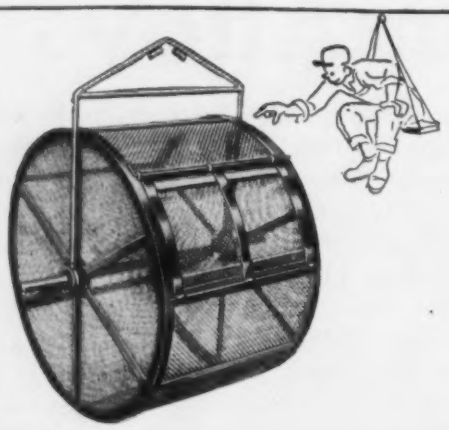


1. HERE'S A 307-POUND WELDED BASKET of perforated Monel* sheet. Capacity 2,500 pounds of bolts —10% more than the same size wood basket it replaced. Sharp edges can't chew into Monel. Metal construction gives easy acid flow and prevents uneven pickling.

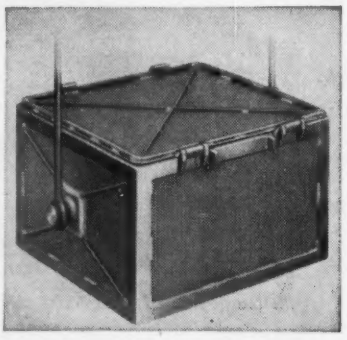
2. NEXT, A SIMPLE AND STURDY BASKET. Made entirely of corrosion-resistant Monel bar, it was welded by ordinary shop methods. The pin at top center is for hooking onto an overhead conveyor. Side index plates lock into the conveyor when the basket is carried. With a tensile strength of 80-95,000 psi, hot rolled Monel bar is a wise—and safe—choice for a job like this.



3. A COMBINATION OF THREE FORMS of Monel — screen, sheet and bar. This revolving basket weighs 220 pounds, and has a capacity of more than 500. The unique top fastening permits fast and *complete* dumping. Because of Monel's toughness and ductility, a basket like this stays in service long after others have hit the scrap heap.



4. STILL ANOTHER combination, this time of Monel angles and flats, welded together and covered with Monel wire cloth. Hanger and shaft are Monel rod. In all forms, Monel provides high resistance to pickling solutions commonly used by steel mills.



5. SMALL PARTS won't hop out of this all-Monel basket. *They're locked in.* The basket lid is easily removed for loading and unloading.

*Reg. U. S. Pat. Off.

Whether you pickle bulky hollow ware, heavy forgings or small stampings, it's easy to build strong, long-lasting baskets that exactly meet your needs.

Use standard mill forms of

Monel*

EMBLEM OF SERVICE INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

News Summary

INFLATION—All the talk about an anti-inflation program has not eased the upward pressure on prices. Wholesale commodity prices have moved up to an all-time high (p. 54) and industrial raw materials and manufactured products continue to climb. Advances in materials costs and wages have caused heavy electrical equipment manufacturers (p. 40) to abandon firm price quotations in favor of price at time of delivery. Similar action is being taken by a number of West Coast steel fabricators (p. 52) in anticipation of further wage and materials advances. Meanwhile Congress has carried the price legislation problem over to January (p. 38).

AUTOMOBILES—Motor car manufacturers now expect (p. 49) to achieve their 5 million-car goal, largely as result of a year-end spurt by Chrysler. Less than 100,000 units remain to be built over the remainder of the year. If the goal is reached, 1947 will be the fourth year in which output exceeded 5 million, the previous years being 1929, 1937 and 1941.

RADIOS—One of the first metalworking industries to achieve a balance between postwar supply and demand is that producing radios (p. 46). Small table models have been in excess supply for several months and a balance is now at hand for the larger, more expensive console models, the result of a record year that saw more than 16 million sets produced. Manufacturers expect demand for the newer television and frequency modulation sets will help sustain volume over the next several years.

METALLICS—The shortage of pig iron and scrap, which has plagued steelmakers, foundries and consequently all metalworking industries since the war, was reviewed (p. 34) in Washington last week before the Martin Steel Subcommittee. Many foundries are reported on part-time operation and face further cuts in operations due to inability to obtain sufficient pig iron. A government mission, including representatives of the steel, foundry and scrap industries, will sail for Europe next week to investigate the potential scrap available in Germany.

WANTED: STEEL MILLS—Large users of flat-rolled steel who would like to buy small steel mills to insure their supply face many difficulties (p. 37). First, few small steel facilities are available: second, the supply of semifinished steel is extremely tight: third, steel mill equipment builders are booked 15 to 18 months ahead, meaning that those entering the sheet-strip rolling business must obtain second-hand equipment. Notwithstanding, many reports of pending deals keep bobbing up; a few materialize.

MOBILIZATION—Deteriorating relations with Russia intensify interest in the progress of American plans for industrial mobilization in the event of an emergency. The plan is gradually taking form under the National Security Resources Board (p. 36).

STEEL TRANSPORTATION—More steel will move by water and truck if rail freight rates continue to rise, the Interstate Commerce Commission was informed by producers at hearing on the carriers' rate increase petition (p. 39). Transportation charges, inbound and outbound on raw materials and products, now average $13.80 per ton of finished steel.

SIGNS OF THE TIMES—Metalworking companies who have been unable to obtain steel because they lacked a historical customer relationship with a mill could have found company in their misery in the Navy Department for the past 18 months. The Navy didn't have a steel source either. Now, however, the department has prevailed (p. 38) on producers to supply 14,000 tons of sheets . . . Watch for news of the gray market in nails, investigation of which is getting underway in Washington . . . Cold Metal Process Co. has been upheld (p. 41) in its patent suit . . . Industrial activity, as measured by STEEL's index (p. 54), is equalling its postwar peak.

Engineering News, P. 61 Market Summary, P. 101

Metallics Shortages Pinch Foundries

Industry representatives tell Senate steel subcommittee of casting shops' difficulties arising from scarcity of pig iron and scrap. Further shutdowns forecast

ACUTE pig iron shortage which already has forced many foundries to go to part-time production schedules and which threatens total shutdowns of many more foundries is more than a manifestation of the general shortage of ferrous metallics, industry men told the Martin Steel Subcommittee of the Senate Small Business Committee in hearings held Dec. 11-12.

Pig iron has been short right along—during and since the war—the subcommittee was told, but the present emergency situation results from a combination of factors that started to enter the picture some five months ago. Unless something is done — and done quickly—widespread industrial paralysis threatens. The areas presently the most badly hit are the Chicago district, a large area centering in Ohio, and the so-called Eastern Pennsylvania district which spreads out into neighboring states.

Foundry Workers Worried—George P. Delaney, of the International Molders & Foundry Workers Union of North America-AFL, estimated that the pig iron shortage threatens to throw 50,000 of this union's members out of employment by Dec. 31. Thousands already are working on such schedules as three days a week. But that is only part of the story, as widespread shutdowns in the foundry industry quickly will shut down other industries.

Causes for Shortage — Adding up what the various witnesses told the subcommittee, these are the causes of the present emergency situation in pig iron:

1—A number of tired blast furnaces have had to be retired from production to undergo necessary rehabilitation and their output currently is missing;

2—The distribution pattern has been sharply affected by such developments as the withdrawal of Woodward foundry iron from the northern markets; purchase of the Brooke furnace by three eastern consumers who will consume the tonnage that formerly was shipped in small lots to many consumers throughout the East; diversion of the entire output of a North Tonawanda, N. Y., furnace interest to the needs of the owning company, the American Radiator & Standard Sanitary Corp.; purchase of the Struthers, O., furnace by the Kaiser-Frazer interests who now are using most of the output of this furnace.

3—Shipment of an undue proportion of the pig iron production, by allocations of the National Housing Expediter, to the cast iron soil pipe industry and to other foundries contributing to the housing program. This allocating power, it was pointed out, will expire Dec. 31. At the same time, there already are signs that such relief as might accrue to non-housing-program foundries from expiration of this allocation power may be wholly offset as a result of simultaneous expiration of the subsidy payment plan which has applied to pig iron produced for the housing program. In fact, the subcommittee was told that at least one interest, American Rolling Mill Co., has advised customers it will be unable to ship them foundry iron after Dec. 31 because of expiration of the subsidy.

4—Undue delay on the part of the government in placing contracts for the rehabilitation of government-owned blast furnaces, particularly in the case of the Gadsden, Ala., stack which because of such delays now is slated to go back into production some time next May.

5—Certain furnaces which have been producing foundry grades have been shifted temporarily to the production of other materials, as spiegel.

"Are there any practical remedies in sight to cure this condition?" the subcommittee wanted to know.

Suggests Producers Review Policies —Douglas J. Strong, president, Foundries Materials Co., Coldwater, Mich., who said he appeared as spokesman for "dozens of foundries in central and southern Michigan," declared that one of the obstacles was the "callous" attitude of the major steel companies who "have absolutely no program to offer to help the foundry industry." He thought a review of their pig iron policies by the steel companies would prove that the tendency is to emphasize production of basic iron for steelmaking rather than foundry iron for the foundries. He thought the subcommittee ought to conduct an investigation to ascertain the facts underlying pig iron sales policy of the steel companies.

If Congress should decide that a return to allocations is necessary, went on Mr. Strong, "we want to be dead sure that they are not going to be mishandled next time." The allocations and price control systems that expired in 1946, he said, worked real inequities in the foundry industry because "the men in charge in Washington were not familiar with long-time practices of the steel and iron industries or wanted to play favorites, or both."

Union Offers Program — The most comprehensive program called for was that advanced by Mr. Delaney. He called for: 1—an investigation to determine the practicability of a voluntary allocations system for pig

SCRAP MISSION

Secretary of Commerce W. A. Harriman has invited representatives of government and the steel, foundry and scrap iron industries to serve on a mission to ascertain all facts concerning potential scrap available in the U. S. zone of Germany. The mission will sail on the "America" Dec. 30 for a stay of six to eight weeks.

The eight mission members are: Chairman, John L. Haynes, Commerce department; Isaiah Frank, State department; Col. S. M. Pool Jr., Army; and these private businessmen: Richard V. Bonomo, Jersey City, N. J.; Joseph B. Andrews, Cincinnati; C. B. Minnes, Buffalo; M. L. Chase, Canton, O.; and George D. Branston, Spring Lake, Mich.

iron; 2—an investigation to determine whether foundries are getting a raw deal on pig iron supplies at the expense of steel; 3—continuation of the pig iron premium payment plan beyond the present Dec. 31 expiration date; 4—an embargo against scrap and pig iron shipments abroad during the period of scarcity; 5—a policy of insistence that every government agency do its utmost to get its scrap to the market; 6—an investigation by the Justice Department to determine the legality of recent acquisitions in the iron and steel industry; 7—reactivation of idle government-owned blast furnaces as rapidly as feasible.

Speaking for the Gray Iron Founders' Society Inc., Cleveland, Hermann P. Good, Textile Machine Works, Reading, Pa., pointed out that the steel companies represent the only source of additional pig iron to which the foundries can look; at the same time he had only high commendation for the efforts which the steel companies are making to serve their foundry customers fairly. He pointed out that Bethlehem Steel Co., for example, is serving foundries during a blast furnace relining interlude at the expense of closing down "three or four of their open-hearth furnaces." But he thought an increased appreciation of the need for supplying the foundries is essential.

Asks Balance Be Maintained — "When the integrated steel mills realize the full import of the 4 to 1 ratio of finished steel to castings (for every 3.9 tons of finished steel produced in the United States there is production of 1 ton of ferrous castings), and we believe they are aware of it, we are confident they will undertake to maintain industrial balance to the best of their ability by enabling foundries to get a sufficient amount of pig iron to maintain the fundamental ratio of wrought steel to castings," said Mr. Good.

For the benefit of the subcommittee's study, R. L. Collier, executive vice president, Gray Iron Founders' Society Inc., supplied it with reprints of a 6-page article from the Dec. 15 issue of STEEL. This feature is devoted to a "special report" on the pig iron shortage and its causes.

Report on Scrap Campaign — Because of the relationship of the scrap problem to the pig iron problem, representatives of the Steel, Foundry & Scrap Industries Committee for Expediting Iron & Steel Scrap were asked to report on the progress so far made in the campaign to bring more scrap into market channels. The spokesmen, John F. Lane, counsel, and L. D. Greene and E. C. Barringer, felt that the long future would most probably take care of itself and that the big problem was to meet the present emergency. Mr. Barringer said the difficulties are caused by the excessive demand rather than by a shortage of scrap. The scrap dealers, he estimated, will bring a total of around 16 million tons of scrap to the market in 1947—a record-breaking achievement.

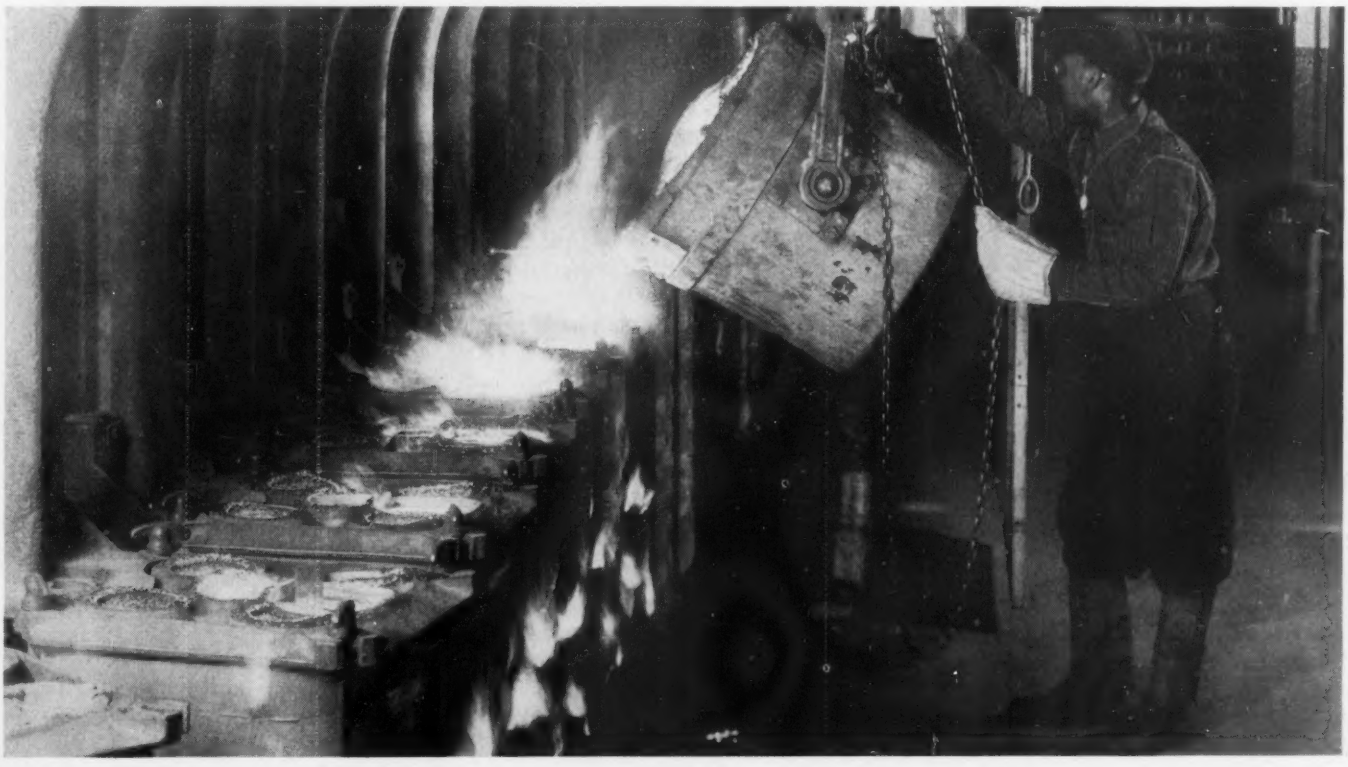
Doubt Value of Scrap Drive—The scrap men did not support a proposal made by L. E. Roark, executive vice president, National Founders Association, Chicago, that the secretary of commerce be asked to organize a scrap drive on the order of the wartime scrap drives. In a recent tour around Chicago, said Mr. Roark, he saw a lot of potential scrap—much of it in forms that require continual upkeep at the taxpayers' expense.

Mr. Greene, however, pointed out that these drives bring out a lot of scrap which is far from desirable—such as tin cans, old bedsteads, bird cages and a thousand and one different items impossible of classification in the scrap yard. Messrs. Barringer and Greene thought that in view of the enthusiasm and thoroughness with which the drives were conducted while the country was at war the tonnage of desirable scrap that now could be brought out would be too small to justify the effort. They were pretty well convinced that present prices are bringing out scrap as rapidly as can be expected—and that a lot of scrap will come out when easier conditions justify the necessary demolition work.

There is only one big reservoir of

(*Please turn to Page* 122)

Many foundries are on part-time operations due to inability to obtain adequate quantities of pig iron and scrap; others are maintaining operations by means of expensive expedients. Shown below is pouring scene in Ford Motor Co. foundry



Mobilization Plan Takes Form

Industrial, military and civilian activities to be co-ordinated under National Security Resources Board. Munitions Board's advisory committee program retained

PLANS under which industry would be mobilized for another war, under the new National Security Act of 1947, are taking form. Uncertainty as to the future status of the industry advisory committees of the Munitions Board has been removed by National Security Resources Board approval of this rule:

"Committees on end products and component parts will continue to be set up by the Munitions Board. The National Security Resources Board will utilize such committees whenever necessary for essential civilian use. Committees on raw materials will in the future serve as 'joint committees' for the assistance of both boards. These methods of utilizing committees prevent duplication of effort and assist in co-ordination of efforts being made by the two boards."

That means, essentially, that the Munitions Board will continue to run the industry advisory committee show under National Security Resources Board policies. Details as to what sort of service will be asked of these committees remain to be worked out, and will become more apparent as the committees are called to meet in Washington. Such meetings should be resumed early in 1948 if present plans remain unchanged.

Mobilization Plan Retained — Another important decision from the standpoint of industry is retention as a basis for further procedure of the industrial mobilization plan worked out by the Munitions Board and recently submitted to leading manufacturers and trade associations as a "restricted" document for comment. "The National Security Resources Board," says the announcement, "will utilize a number of agencies to do the spade work which goes into the plan. The annual Industrial Mobilization Plan is to be promulgated by the National Security Resources Board. . . The Munitions Board, in view of the law requiring it to plan for the military aspects of industrial mobilization, will continue to play a major role in this work."

Stockpiling — Under still another decision, the Munitions Board will continue to administer the strategic and critical materials stockpiling program, but under policies laid down by the National Security Resources Board.

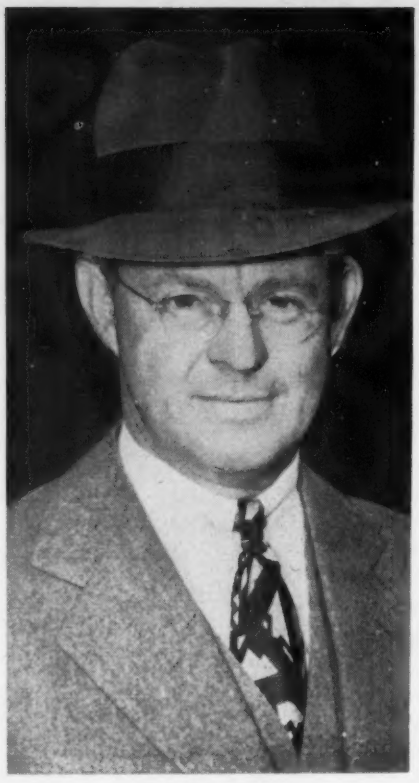
These decisions have resulted from a series of conferences between Arthur M. Hill, chairman of the National Security Resources Board, and Thomas J. Hargrave, chairman of the Munitions Board. Others in a position of responsibility under the National Security Act of 1947 have participated. Those so far spearheading the organizational plans under the act, in addition to Messrs. Hill and Hargrave, are principally: James Forrestal, secretary of defense; W. Stuart Symington, secretary of the air force; Sidney W. Souers, executive secretary of the National Security Council; Dr. Vannevar Bush, chairman of the Research and Development Board; Rear Adm. Roscoe H. Hillenkoetter, director of the Central Intelligence Agency; Maj. Gen. Alfred M. Gruenther, director of the Joint Staff.

In addition, informed outsiders are called in for advice and assistance. For example: Bernard M. Baruch spent two days in conference with these men recently because of his "background in organizational matters."

NSRB Closest to Industry—In the new military organization, of course, the National Security Resources Board will be the closest to industry—except to the extent the board delegates its authority and responsibilities to subordinate groups such as the Munitions Board.

"It shall be the function of the Board," says the new law, "to advise the President concerning the co-ordination of military, industrial, and civilian mobilization" and then goes on to define the duties in detail. Of the various subparagraphs the following is the most important from the standpoint of industry:

"It shall be the function of the board to advise the President concerning. . . .programs for the effective use in time of war of the nation's natural and industrial resources for military and civilian needs, for the maintenance and stabilization of the civilian economy in time of war, and for the adjustment of such economy to war needs and conditions." It shall advise on "the strategic relocation of industries, services, government, and economic activities, the continuous operation of which is essential to the nation's security."



ARTHUR M. HILL

Members Are Civilians — Membership of the board, by special intent and provision of Congress, is civilian throughout. Aside from Mr. Hill, its members are cabinet officers. They include Secretaries Snyder, Forrestal, Krug, Anderson, Harriman and Schwellenbach. The spade work will be done under the direction of Mr. Hill who says he will begin at once to enlist the active assistance of industry, agriculture and labor.

"The best brains in the country are needed, and will be obtained, to help solve the complicated problems involved in the duties of the board," says Mr. Hill. "It will draw on the wealth of experience resulting from World War II. It will make maximum use of the universities, research institutions, engineering and management firms, professional societies, management, labor and consumer organizations. It will have a permanent staff which will give continuity to the work. The staff will be supplemented by men of outstanding capabilities from private life who will be asked to serve full time on a rotating basis or in an advisory or part-time capacity. This will lead to a roster of men familiar with mobilization plans, who can be called upon to fill key positions in a national emergency."

Headquarters in Pentagon — Mr. Hill's group now is installed in a small suite in the Pentagon Building. While the size of its organiza-

tion cannot be known until some of the pending organizational matters have been decided, the chances are that the board's direct staff will be rather small—with arrangements to have numerous other organizations act as its agents. In view of the fact that the board reports directly to the President, it is expected to move soon into quarters in the old State Department Building next to the White House which, since State moved to the new marble-adorned building at Twenty-first street and Virginia avenue, rapidly is becoming the office building for the President's staff.

While most of Mr. Hill's program remains to be developed, he has taken a very progressive step right at the outset. He has appointed, as his director of public relations, a competent and experienced man who knows his way around Washington. He is Vincent F. Callahan (telephone: REpublic 6700, Extension 721161) who knows the answers as the board shapes its policies.

Hopes To Cut Red Tape—Mr. Hill, personable and magnetic businessman who is on leave from his duties with various companies—his chief job is that of chairman of the Greyhound Corp.—thinks the new board can dodge an awful lot of red tape that formerly hindered speedy action. The board, he has found, is charged with "blueprinting administrative agencies to handle the jobs which, during the last war, were done by 36 different organizations including, for example, the Office of War Mobilization, War Production Board, the Office of Defense Transportation, War Labor Board, Office of Economic Stabilization, Office of Price Administration, War Shipping Administraton—to name only a few.

"When Congress created the National Security Resources Board it had in mind the possibility that it might become necessary in another emergency to establish even more complete and extensive controls," comments Mr. Hill.

The inference, of course, is that business men and industry, in order to prevent the imposition of impractical, discriminatory or otherwise undesirable controls in a possible war, should ignore no opportunity to give maximum assistance to Mr. Hill and his board. If another war comes, the controls will have to go into effect at once; it will be too late then to plan and create them in leisurely fashion. That is why many forward-looking business men, and business organizations, are taking the initiative at this time to find how they can co-operate.

Steel Mill Equipment Scarce

Builders booked far into future though some accessory equipment is available promptly. Manufacturers seeking to engage in steel rolling must depend on used facilities

CRITICAL sheet steel shortage, expected to hold through 1948 and possibly well into the following year, is prompting large buyers of flat-rolled steel, especially automotive interests, to seek supplementary sources through acquisition of existing steel plants or establishment of completely new rolling units. As pointed out in STEEL (p. 60, Dec. 15) there are at least six such projects now reported in negotiations.

Last week it was reported some interests were considering leasing a small open hearth furnace at National Roll & Foundry Co.'s Avonmore, Pa., plant.

Tucker Reported Seeking Supply—Also, an unconfirmed report was circulating in the trade last week to the effect the Tucker Corp., Chicago, newly formed automobile company, is negotiating for a sheet steel supply source, and that the Kaiser-Frazer interests are attempting to obtain equipment for rolling aluminum sheets. Another report was to the effect unnamed interests are considering installing hand steel mill equipment in the old Davey Steel Co.'s plant building in Cleveland.

Lauson Stone, chairman and president of Follansbee Steel Corp., Pittsburgh, last week emphatically denied a report that negotiations were under way looking to the purchase of his company by Sears, Roebuck & Co., According to the report, $50 per share is being offered for the Follansbee stock. Mr. Stone said the Sears report was only one of four such rumors concerning his company which have been circulating. The others included purchase by Jones & Laughlin Steel Corp.; purchase by Youngstown Sheet & Tube Co., and purchase by the Du Pont interests. All of the rumors are unfounded, he said. Recently an official of the Reeves Steel & Mfg. Co., Dover, O., denied his company was involved in any deal.

Few small, nonintegrated steel mills remain as likely purchases by large consuming interests. Within the past year several such small plants have been acquired.

Face Hurdles — Several difficult hurdles are confronted by manufacturers seeking to engage in the steel business. Not only are there few nonintegrated steel plants remaining as likely prospects for acquisition but available mill equipment for new units is scarce.

Manufacturers planning to establish new rolling units will be forced to purchase used hand mills if they expect to get into operation in the near future. Leading builders of steel mill rolling equipment are unable to promise deliveries under 15 to 18 months due to extended order backlogs. However, certain mill equipment is available fairly promptly. For instance, the Guide Co., Canfield, O., is in position to give relatively prompt delivery on sheet levellers; uncoilers; coilers; slitters; pay-off-reels; roller tables; pinion stands; gear drives; hydraulic shears; coil feed units; materials handling equipment; sheet inspection tables; special lathes and spinning machines.

Some steel mill equipment brokers contend sufficient secondhand units with accessories can be obtained.

Perhaps typical of recent rolling mill equipment negotiations by large steel consumers is that of Hudson Motor Car Co. which has leased two-thirds of the former Shenango tin plate plant of Carnegie-Illinois Steel Corp. at New Castle, Pa. Two 3-high and six 2-high mills will be installed at this plant. These mills were purchased from Frank B. Foster, Pittsburgh, who obtained them from the old plant of the former Seneca Iron & Steel Co. at Lackawanna, N. Y., now owned by Bethlehem Steel Co. Last September International Detrola Corp., Detroit, purchased an 84-inch plate mill from Lukens Steel Co., consisting of a 2-high roughing stand and a 4-high finishing stand.

J. P. Ludgate & Associates, Pittsburgh, recently sold a 48-inch 3-high break-down mill and two 2-high skin pass mills to Portsmouth Steel Corp. The Ludgate firm had bought these units from Corporacion de Fomento de la Produccion Co., which had purchased the entire steel plant of Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont.

One source of used rolling mill equipment is said to be the DPC plant at Newark, O., used during the war for production of aluminum. This plant is reported to have an estimated $77 million worth of equipment, including a blooming mill which could be utilized in rolling steel slabs and billets.

Control Bills Carried Over To January

INFLATION control legislation was carried over to the regular session of Congress in January when Republican stop-gap bills, offered as a substitute for the administration's program, failed of passage last week.

The Republican bills would have authorized voluntary agreements for price reduction, exempt from the anti-trust laws, continuation of export controls, continued controls over freight car allocations and increased gold reserves to be held by Federal Reserve banks.

When Congress reconvenes next month, the anti-inflation program will be one of the first orders of business. Over the holidays the Republicans are expected to formulate a more complete program.

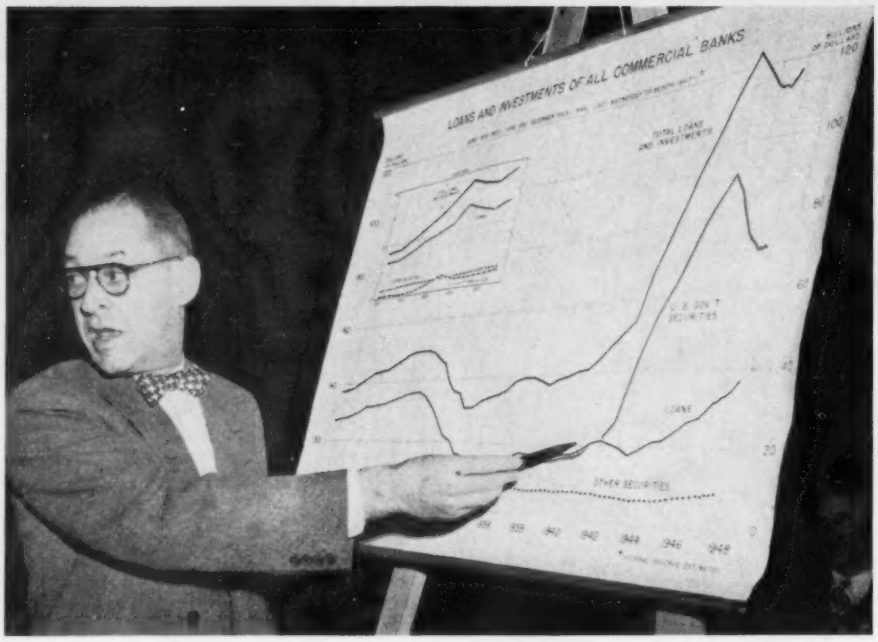
Flavored with Politics — Maneuvering in the closing days of the special session made it clear that the conflict over anti-inflation legislation would continue for some weeks. It will shape up as one of the leading issues in the 1948 elections campaign, with the political flavor of the issue heightened by the fact that a major draftsman of the Republican program is Sen. Robert A. Taft, Presidential candidate and one of Mr. Truman's most outspoken critics.

Main points of the rival programs:

Allocations — President Truman asked power to allocate essential industrial commodities in short supply, export and transportation controls. The Republicans approved export and transportation controls, but substituted a proposal that industry be permitted to make voluntary allocations of scarce materials, exempt from antitrust laws.

Money Controls — Mr. Truman wants power to regulate consumer and bank credit and curb speculation on commodity exchanges. Republicans agree in principle, differ on methods. They propose that the commodity exchanges regulate speculation by voluntary agreement, that the Federal Reserve banks be required to maintain gold reserves of 40 per cent instead of the present 25 per cent.

Rationing — The President asks power to ration scarce consumer commodities, to set price controls and to fix wage ceilings where needed to maintain price controls. Republicans have yet to offer rationing proposals.



Marriner S. Eccles, chairman of the Federal Reserve Board, submits proposals for consumer credit controls to congressional committee studying anti-inflation legislation. Mr. Eccles also proposed that FRB be authorized to require banks to maintain special reserves as a means of tightening bank credit. NEA photo

Navy's Sheet Steel Needs Met

THE NAVY has prevailed upon 11 steel companies to supply 14,000 tons of badly needed sheet steel.

Thus ends an impasse that began in May, 1946. During these 18 months the Navy, having no customer history relationship with any of the major producers, and hence having no position in the allocation plans of these companies, has been unable to cover its requirements of sheets for maintenance work.

As a result, repairs requiring a relatively small tonnage of steel have been delayed until at present the Navy has an accumulation of repair work both afloat and ashore which has reached embarrassing proportions.

"While the Navy still does not have definite contracts covering its minimum needs for sheet steel, definite commitments have been made by officials of the companies as a result of recognition of the fact that the steel industry bears a part of the responsibility for maintaining an adequate Navy," according to Commander Edward F. Metzger, who initiated and conducted the negotiations.

Army To Follow—Now that the Navy has inaugurated this new basis for obtaining steel during the present period of shortage, the Army is following suit. The first Army requirement to be placed as a result of a patriotic appeal is for 10,000 tons of sheets.

The Navy hopes to place its other product requirements through the allocation method and already has obtained acceptance of orders for substantially one-third of 5000 tons of pipe which it will need for maintenance and repair purposes in 1948.

The quantities of the other products in the program are as follows: Concrete reinforcing bars 700 tons; pig iron 400 tons; light plate 1000 tons; nails 600 tons; structural shapes 700 tons; cast iron pipe, 4-inch and 6-inch, 500 tons.

"DAISY CHAIN" STEEL

The Navy last week spiked as "completely without foundation" the report recently circulating that it would sell 150,000 tons of surplus steel plate.

Probe of the rumors followed a trail from a Pennsylvania export company acting for a Connecticut man, to a New York City brokerage house, to another New York City broker. This last person said there had been talk of such a quantity of steel, but that nothing had come of it because it had never been located. He said reports he heard described the steel as "made to Navy specifications," not as being the property of the Navy.

Steel Traffic Change Hinted

Increased diversion of shipments from the railroads to other forms of transportation seen should rail rate boosts unduly disturb existing competitive relationships

BROAD hint that the steel industry's freight traffic may be diverted increasingly from the railroads to other forms of transportation recently was given by Jacob W. Hoover, general traffic manager, Carnegie-Illinois Steel Corp. and National Tube Co., at an Interstate Commerce Commission hearing in Boston.

Mr. Hoover suggested any rail-rate increase should be made to result in the least possible disturbance to existing commercial competitive relationships.

"Otherwise, increased freight charges may not result in the intended additional income," he said. "It is our belief that as the pipelines of production are filled there will be a further gain in water movement of iron and steel products.

"We think this fact must have been a most important consideration in the decision of the rail carriers to propose in this case that the increase in rates on iron and steel should be limited to a maximum number of cents."

Desires Flat Increase—The steel industry wishes any rate increase to be a flat or horizontal one, rather than by percentage. If the ICC does not grant the full limit of the railroads' request for percentage increases, then it feels the maximum amount set forth by the railroads applicable to iron and steel also should be cut.

During 1944, Mr. Hoover said, the steel industry paid $872,515,000 transportation charges on raw materials and products, inbound and outbound, or an average of $13.80 per ton of finished steel product.

During the first nine months of 1947, the six major steel producing subsidiaries of United States Steel moved by truck more than 6 per cent of their total shipments of finished steel, he said, and added:

"Other steel companies have stated that they ship a much higher proportion of their finished products by truck."

Stating that unquestionably a large percentage increase in rail freight rates would result in greater use of trucks for shipment of steel, he continued:

Truck Shipment Flexible — "Many of the products of iron and steel manufacture lend themselves readily to truck transportation, and in recent years the volume of this traffic has grown not only on what may be termed 'short hauls,' but even on the longer hauls. The flexibility of motor transportation, fast movement, frequent service, and in many instances, low cost, are factors contributing to this situation.

"For many years large tonnages of steel have moved to the Detroit markets by water and truck. The proportion so moving has been increasing in recent years."

SHIPMENTS OF STEEL PRODUCTS IN OCTOBER AND YEAR TO DATE

Steel Products	Number of companies	Items	OCTOBER - 1947			To Date This Year			Whole Year 1946		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	281,223	4.9	229,572	* 2,501,294	4.8	* 1,809,014	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	398,728	7.0	166	3,712,577	7.1	2,558	3,474,284	7.1	5,399
Steel piling	4	3	28,452	0.5	-	268,748	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	589,108	10.4	19,115	5,241,439	10.0	183,554	4,152,181	8.5	250,709
Skelp	7	5	10,705	0.2	38,707	139,754	0.3	329,199	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	189,535	3.3	126	1,822,737	3.5	991	1,790,311	3.7	4,890
—All other	5	7	24,748	0.4	62	176,461	0.3	329	144,999	0.3	426
Joint bars	7	8	14,989	0.3	1,671	150,173	0.3	13,423	176,803	0.4	5,327
Tie plates	9	9	45,271	0.8	394	426,178	0.8	4,137	447,496	0.9	18,700
Track spikes	8	10	13,830	0.2	-	140,974	0.3	74	146,194	0.3	693
Hot Rolled Bars—Carbon	34	11	555,071	9.8	67,488	* 5,232,799	10.0	* 614,789	5,006 859	10.3	707,991
—Reinforcing—New billet	15	12	115,944	2.0	1,214	* 1,058,371	2.0	8,635	1,048,483	2.1	7,381
—Rerolled	12	13	17,524	0.3	-	* 144,125	0.3	-	141,346	0.3	1,267
—Alloy	27	14	144,749	2.6	18,488	* 1,455,528	2.8	* 178,261	1,390,278	2.8	138,395
—Total	45	15	833,288	14.7	87,190	* 7,890,823	15.1	* 801,685	7,586,966	15.5	855,034
Cold Finished Bars—Carbon	29	16	114,692	2.0	1,130	* 1,225,155	2.3	7,978	1,316,579	2.7	2,428
—Alloy	26	17	15,082	0.3	325	187,765	0.4	1,988	196,237	0.4	1,725
—Total	35	18	129,774	2.3	1,455	* 1,412,920	2.7	9,966	1,512,816	3.1	4,153
Tool steel bars	19	19	6,589	0.1	61	74,656	0.1	1,224	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	156,382	2.7	7,061	1,403,272	2.7	57,178	1,276,289	2.6	45,393
—Lap weld	8	21	30,413	0.5	45	326,111	0.6	797	305,516	0.6	238
—Electric weld	11	22	105,075	1.8	299	901,602	1.7	1,984	674,459	1.4	591
—Seamless	10	23	183,778	3.2	12,499	1,719,250	3.3	115,034	1,871,540	3.8	83,441
—Conduit	7	24	14,503	0.3	904	126,107	0.2	7,122	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	60,300	1.1	1,652	549,019	1.0	17,035	429,180	0.9	3,478
Wire rods	22	26	62,810	1.1	31,809	560,799	1.1	278,423	679,998	1.4	346,506
Wire—Drawn	39	27	249,154	4.4	15,613	*2,144,291	4.1	* 150,451	1,933,124	4.0	135,592
—Nails and staples	18	28	68,430	1.2	521	674,987	1.3	6,990	636,632	1.3	797
—Barbed and twisted	15	29	24,612	0.4	1	211,503	0.4	68	207,610	0.4	-
—Woven wire fence	13	30	39,164	0.7	327	344,066	0.6	3,118	383,230	0.8	-
—Bale ties	12	31	10,214	0.2	-	101,044	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	62,946	1.1	-	664,067	1.3	1,853	781,167	1.6	3,179
—Chemically treated	8	33	588	-	-	17,707	-	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	196,526	3.5	-	1,715,093	3.3	228	1,924,657	3.9	-
—Electrolytic	9	35	152,008	2.7	-	1,298,464	2.5	529	909,173	1.9	-
Sheets—Hot rolled	31	36	659,149	11.6	48,747	*6,008,936	11.5	* 477,456	5,521,463	11.3	421,198
—Cold rolled	17	37	480,265	8.5	2,805	4,494,304	8.6	22,669	4,075,554	8.4	3,397
—Galvanized	16	38	148,997	2.6	107	1,340,901	2.6	656	1,462,053	3.0	1,725
—Electrical and enameling	10	39	54,206	1.0	-	483,756	0.9	385	435,170	0.9	-
Strip—Hot rolled	23	40	157,444	2.8	30,231	*1,453,935	2.8	* 248,724	1,363,812	2.8	237,176
—Cold rolled	34	41	151,309	2.7	2,829	1,352,406	2.6	23,683	1,282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	29,668	0.5	-	300,203	0.6	2	252,308	0.5	348
Axles	5	43	17,416	0.3	-	153,346	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	142	45	5,681,597	100.0	533,969	*52,303,903	100.0	*4,570,615	48,775,532	100.0	4,297,889

* Adjusted.

Electric Goods Pricing Changed

Firm price policy for heavy electrical equipment dropped by major producers. Extended delivery dates and increasing costs make escalator clause mandatory

ABANDONING the firm price policies established early this year, major producers of heavy electrical apparatus such as motors, generators, and power transformers are now quoting on a "price in effect at time of shipment" basis.

Because much of this equipment ordered now cannot be delivered before 1950, the actions were made necessary by the abnormal risks involved in firm quotations for such an extended period.

In announcing their policies, Westinghouse Electric Corp., Pittsburgh, and General Electric Co., Schenectady, N. Y., stated these actions were taken in preference to price increases at this time based on anticipated increases in costs. Both companies stressed the advances in materials costs which had occurred since their firm pricing policies were laid down. Prospect of another round of wage raise demands was also a factor in their considerations.

Relative Stability Cited—Prices of heavy electrical equipment have been kept relatively low compared with other products, G-E officials explained, citing an average price rise for all their products from 1940 through September, 1947, of only 38 per cent, compared to 86 per cent for all manufactured products and 107.5 per cent for farm products. During that period the company's hourly wages rose 73 per cent and its metals purchases cost 57 per cent more.

Westinghouse pointed out that since its firm price policy was established last May, materials prices, instead of stabilizing as had been hoped, continued to increase. The company in the period booked approximately $290 million in orders which will be manufactured at unpredictably higher costs over the next three years.

To protect their customers, individual producers have provided limitations on the extent of price increases which may be made between ordering and delivery dates and have promised that any price reductions made during that period will be given immediately to open orders. Westinghouse, for example, has placed a ceiling of 20 per cent on the extent of price increases possible between those two dates.

General Electric's action was made effective from Dec. 5, with Westinghouse and Allis-Chalmers Mfg. Co., Milwaukee, dating their policies from Dec. 12.

Equipment Requisitioning By JANMAT Accelerates

Following the recent acceleration in requisitioning machine tools, the armed services, through the Munitions Board's Joint Army-Navy Machine Tool Control Committee, have expanded their "stand-by" program to cover numerous types of other industrial equipment. Recent requisitions of materials handling equipment have been particularly heavy and War Assets Administration inventories already have been exhausted in certain categories. The program, as it will be carried out over the next few months, is expected to absorb fully 50 per cent of the general industrial equipment now in WAA inventories.

The JANMAT committee now is calculating the additional funds which will be required to buy and place in storage the greater number of tools and other equipment called for by the enlarged program, and will soon ask the Bureau of the Budget for the necessary authorizations.

Quonsets To Replace Ohio Plant Destroyed by Fire

Materials for steel Quonset buildings to replace conventional-type factory structures were shipped last week to Scio Pottery Co., Scio, O., after the company's facilities were almost completely razed by fire on Dec. 11. The only building undamaged at the site was a steel Quonset warehouse.

The pottery company's order for Quonsets to cover 60,000 sq ft was placed with McCrady-Rodgers Co., Pittsburgh, dealer of the structures made by the Stran Steel Division, Great Lakes Steel Corp., Detroit.

Present, Past and Pending

ALABAMA ORE MINE WILL BE REOPENED
BIRMINGHAM—Rehabilitation in preparation for reopening of Woodward Iron Co.'s Redding ore mine, closed since 1927, is under way.

SEEKS TO STAMP OUT NAIL GRAY MARKET
WASHINGTON—Behind closed doors, Sen. Ralph E. Flanders met last week with representatives of 26 nail manufacturers to ask their help in stamping out the nail gray market.

COMPANY EXPANDS POWDER METAL CAPACITY
DETROIT—Amplex Division of Chrysler Corp. is greatly expanding capacity to produce powder metal bearings, machine parts and cored and bar stock of larger sizes, President A. J. Langhammer reports.

LEVINSON NAMED REYNOLDS ALUMINUM DISTRIBUTOR
PITTSBURGH—Levinson Steel Sales Co. has been appointed distributor for the Aluminum Sales Division, Reynolds Metals Co., in the Pittsburgh area.

SHOE MACHINERY COMPANY FACES ANTITRUST SUIT
BOSTON—U. S. Department of Justice has filed a civil antitrust suit charging United Shoe Machinery Corp. with violation of Sherman Act by monopolizing United States shoe machinery industry. The suit seeks to compel the corporation to sell some of its plants, to offer shoe machinery for sale rather than lease, and to make patents and know-how available to competitors.

STEEL WAREHOUSE MANAGER TO RETIRE
PHILADELPHIA—Guy P. Bible will retire Jan. 1 from general managership of Horace T. Potts Co., steel distributor, and will be succeeded by Claude Mengle, affiliated with the company more than 27 years. Mr. Bible, with the company 36 years, will continue as a partner.

NEW ZINC MINE BEING OPENED IN ILLINOIS
GALENA, ILL.—Eagle-Picher Mining & Smelting Co. is sinking a shaft into a large body of zinc ore apparently overlooked by oldtime miners.

Cold Metal's Steckel Patent Claims Upheld

COLD Metal Process Co., Youngstown, was cleared of all charges of fraud in obtaining its two basic patents on the Steckel steel rolling process in a Sixth District U. S. Circuit Court of Appeals decision handed down in Cincinnati Dec. 12.

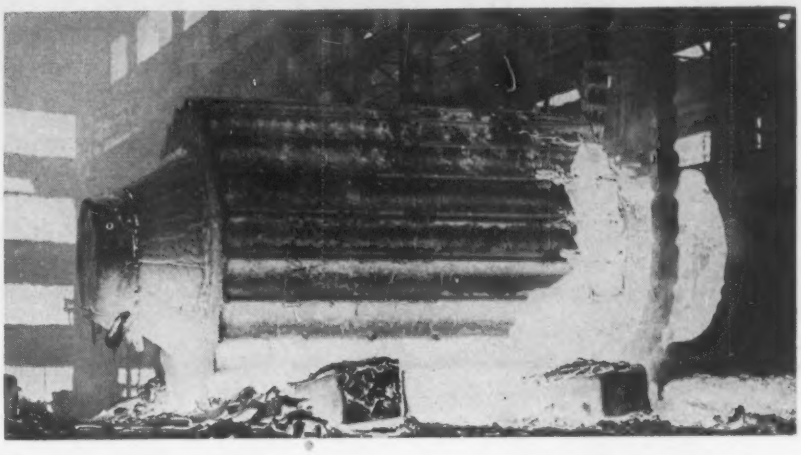
The appeals court upheld a district court ruling in Cleveland dismissing a government suit which sought to cancel patents held by the company and which involve the cold rolling of steel and other metals to thin strip without intermediate annealing processes. Both patents held by the company had been upheld previously in court litigation.

About $10 million has been paid in by various steel companies as royalties for use of these patents. This money, which has been held in escrow pending outcome of the suit, eventually will be paid over to the L. A. Beeghly Fund which was formed several years ago to make charitable, religious and educational bequests. A number of steel companies using the process have made settlements for patent infringement, while others are paying large royalties. The patents run out this year.

Principal fraud alleged in the government's suit was that Cold Metal represented to the Patent Office that the Steckel mill secured complete and perfect random orientation. A careful reading of reports shows that "the Steckel pattern more nearly approaches the ideal x-ray pattern than any I have ever observed in my own researches or have ever seen published." This was the statement made in one of the patents by Dr. George Clark, representing Cold Metal Process Co.

Circumstances involving the second claim was that A. P. Steckel, F. C. Biggert Jr. and Lane Johnson, who were prosecuting separate patent applications covering overlapping processes and disclosures in 4-high rolling mills, were represented in the Patent Office in the allowance of their patents and in interference proceeding by the same attorneys. However, the action taken by the attorneys, so far as being fraudulent, was held by the court as in strict accord with Bar canons.

Judge Florence E. Allen, of Cleveland, in writing the appeals court decision, saw no evidence of fraud.



Building 2000-Ton Cyclotron Magnet

YOKE and pole pieces for the 2000-ton magnet of the cyclotron now under construction at Columbia University's new nuclear research laboratory were produced at Bethlehem Steel Co.'s Bethlehem, Pa., plant. The magnet was made of special low-carbon steel for high permeability quality.

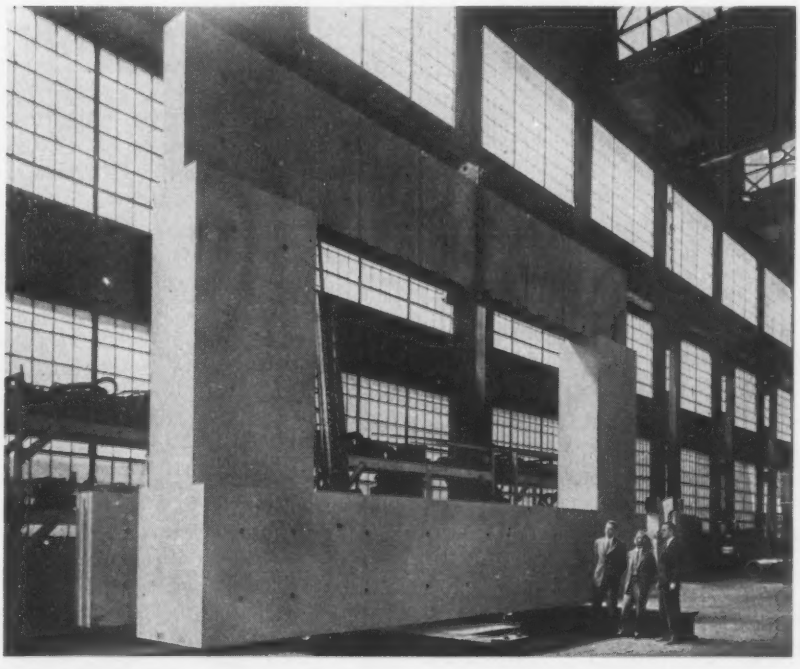
Design of the magnet was developed after an extended series of tests at Columbia to determine most effective pole tip and gap contour.

Yoke is a rectangular assembly 33 ft long, 21 ft high and 14 ft 2 in. wide, with a window 22½ ft by 10½ ft, in which are placed the upper and lower pole pieces of the magnet. Yoke is built up of heavy forged steel plates bolted together, ten plates each in the top and bottom sections and five vertical plates at each end. Top and bottom plates weigh 60 tons each, side plates weigh 38 tons.

Each pole is made of two 47-ton cylindrical core plates 13½ ft in diameter, one shouldered pole plate weighing 43 tons and two sets of pole tip plates 6 and 8 in. thick.

Plates were forged from large ingots weighing 230 tons each on a 7500-ton steam-hydraulic press.

Photos show, above, 460,000-lb ingot being removed from heating furnace; below, Dr. E. T. Booth and associates of Columbia inspecting magnet yoke assembly in Bethlehem's machine shop.



Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Government employment turns upward for first time in 17 months. Period of shrinking federal payrolls believed at end. Over 2 million employed as of Oct. 31

FEDERAL employment in October showed a net gain of 2626, the first rise in 17 months. Alarmed by this development, economy-minded Senator Harry F. Byrd (Dem., Va.) has recommended a study of the causes by the House and Senate Appropriations Committees.

In his communication to these committees Senator Byrd takes into consideration a generally held view in Washington that the period of shrinking government payrolls has reached its end and that from now on the number of federal employees will increase. In other words, nobody familiar with the overall situation takes seriously the threat of Chairman John Taber (Rep., N. Y.) that another 500,000 employees will be dismissed by the government during fiscal 1949.

Reasons for Increase—There are three good reasons to expect some increase in government employment. First, congressmen who voted for the retrenchments of fiscal 1947 and 1948 have received many complaints from constituents over termination of many government services on which they had come to rely. Second, Congress is considering establishment of some new units which would require more employees, as a Department of Transportation, a Department of Welfare, Education & Security, a National Science Foundation, etc. Third, the government needs larger staffs to handle international affairs.

The last Civil Service report shows a grand total of 2,024,226 government employees on Oct. 31. This included 1,773,917 within United States confines and some 250,000 abroad. The following breakdown shows the number of employees within the United States for each government unit with more than 5000 names on its payroll:

Army 252,000, Navy 296,000, Air Force 110,000, Post Office 460,000, Veterans Administration 201,000, Treasury 86,000, Agriculture 70,000, Commerce 34,000, War Assets Administration 33,000, Federal Security Agency 32,000, Justice 24,000, Tennessee Valley Authority 14,000, Housing & Home Finance 12,000, Maritime Commission 9400, State 71,000, National Advisory Committee for Aeronautics 6000, RFC 6700.

Employment of Americans outside the United States breaks down as follows for those branches having more than 5000 employees:

Army 137,000, Navy 44,000, State 13,584, Panama Canal 16,000, Maritime Commission 15,466, Panama Railroad 7000.

On the basis of complaints to congressmen, there is a good chance of a further increase, rather than any further curtailment, in the number of employees of the Post Office, Labor, Commerce, Agriculture and Interior Departments.

Tariff Cuts Effective Jan. 1

Tariff cuts on the majority of commodities, as agreed upon by the United States in the trade and tariff agreements negotiated at Geneva, Switzerland, last summer, were proclaimed in effect on Jan. 1, 1948, by President Truman last week. In his proclamation, however, the President specifically omitted several hundred commodities from the proposed tariff reductions.

The list of omissions seeks to eliminate from the tariff cut benefits those countries which have not made concessions and signed the trade agreements.

Minerals Council Formed

A National Minerals Advisory Council to advise Secretary of the Interior J. A. Krug on the policy and program relating to the mineral supply position of the United States was organized recently by 31 representatives of the mineral industries. The council is composed of representatives of both the extractive and processing industries from all parts of the country, and includes both large and small producers.

Donald H. McLaughlin, New York, president of the Homestake Mining Co., was elected chairman of the council. Six commodity committees, each headed by a vice chairman, were established as follows: Ferrous metals—Alexander C. Brown, Cleveland, president, Cleveland Cliffs Iron Co.; Copper metals—R. Page, New York, president, Phelps Dodge Corp.; Lead-Zinc metals—H. I. Young, St. Louis, president, American Zinc, Lead & Smelting Co.; Precious metals—D. H. McLaughlin, New York, president, Homestake Mining Co.; Alloy metals—W. J. Priestley, New York, Union Carbide & Carbon Corp.; Industrial minerals (including light metals, such as aluminum)—H. M. Albright, New York, president, United States Potash Co.

C. K. Leith, Washington, was elected vice chairman-at-large. The vice chairmen of the six commodity committees, together with the chairman and the vice chairman-at-large comprise the executive committee of the council which was assigned the task of formulating agenda for future meetings.

The council voted to establish six functional committees, representation on which would be drawn from the commodity committees, the several vice chairmen having the au-

STAINLESS SAVES

Stainless steel containers, although costing originally in some cases four times as much as drums of other material, have been found to be economical in many industries over the length of the container's life.

Production of the containers, now being made in one-gal. to 55-gal. capacities, has increased 500 per cent since the beginning of the war, and demand for them by the food, drug and chemical industries is expanding, W. I. Hanrahan, vice president, United States Steel Products Corp., subsidiary of United States Steel Corp., discloses.

The drums' service life is estimated at about 14 years and as much as $3 or more per barrel can be saved each year when figured on a "cost per trip" basis. Cleaning and reconditioning them before each use is also simplified and as a precaution against theft they can be marked with special serial numbers permitting immediate identification.

fast operator... (Quick Exchange)

WHEN the tool room is flooded with calls for the fast production of odd lots of work, you need an internal grinder that's a fast operator —one that can be set up easily and changed over quickly. You need a Bryant No. 112 Internal Grinder.

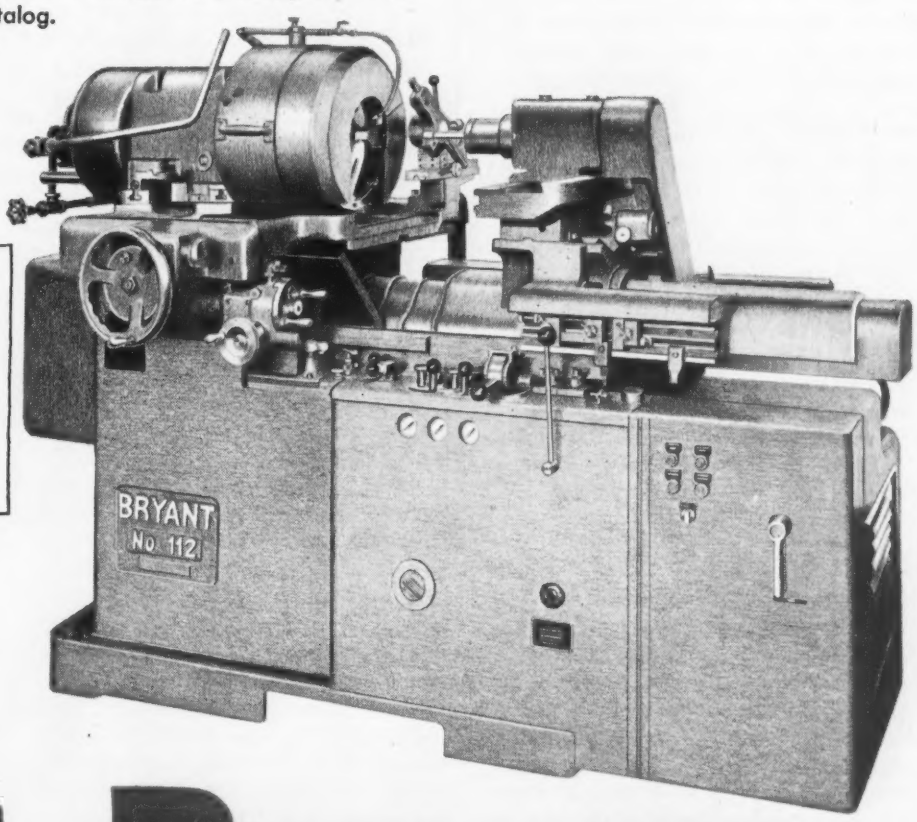
Quickly adjusted cycle controls for wheelslide—Selection of cycle phases either manually or automatically through main wheelslide control. Independent setting of wheelslide traverse for wheel dressing and grinding by two convenient hand throttles. Universal stop rod positions wheelslide for face grinding. Positive locking reversing dogs for setting grinding stroke quickly. Belt driven wheelheads; Hi-Frequency wheelheads for speeds up to 100,000 R.P.M.

Work spindle designed for operating efficiency—Rigid setting for taper grinding up to 90° included angle, provided by double circular slide mounting. Infinite spindle speeds from 100 to 1000 R.P.M. Quick interchange of chucks, holding fixtures and face plates provided by American Standard Type Cam Lock Spindle Nose.

Three cross-feed controls for versatility—Fast set-up provided by rapid traverse cross-feed. Increased output on long runs with power cross-feed control. Accurate size control through precision feed dial. These are the highlights that make set-up of the 112 simple and change-over fast. When combined with the basic features available in all Bryant grinders, they add up to less down time, more accurate work, finer work finish and faster production.

For more details on a fast operator that can handle more calls per day, just ask for the Bryant No. 112 catalog.

No. 112
HYDRAULIC
INTERNAL GRINDER



Send for the Man from

BRYANT CHUCKING GRINDER CO.

SPRINGFIELD, VERMONT, U. S. A.

BRYANT

thority to appoint the representatives. These functional committees, after studies on designated subjects and following the preparation of their reports, would report to the council as a whole for opinion and action. The tentative titles of the functional committees are as follows: Marginal deposits, public lands, technology, stockpiles, American foreign mining activities, exploration and development incentives.

The next meeting of the council will take place, it was decided, upon the call of the Secretary of the Interior when requested to do so by the executive committee.

Set Up Statistical Unit

Newest unit at the National Bureau of Standards is a National Computing Center which is slated to find short-cuts to many statistical tasks. Initial work will embrace the interpretation of results obtained from small samples. Dr. T. J. Killian, science director, Research Divisions, Office of Naval Research, describes the enterprise as follows:

"In many fields, notably medical research and in industrial and military research and development work, it is often very expensive, or even impossible, to make a large number of tests or to obtain a large number of observations. This makes it imperative to use the most efficient mathematical and statistical methods to analyze and interpret scientific data. Such methods can be used not only to assess the reliability of the conclusions to be drawn from data, but also make it possible to design experiments so that certain conclusions can be drawn with a minimum number of tests."

While the new center was suggested and at first almost wholly supported by the Office of Naval Research, it is to function co-operatively for other departments, including Army and Air Force, the Census Bureau and the Comptroller.

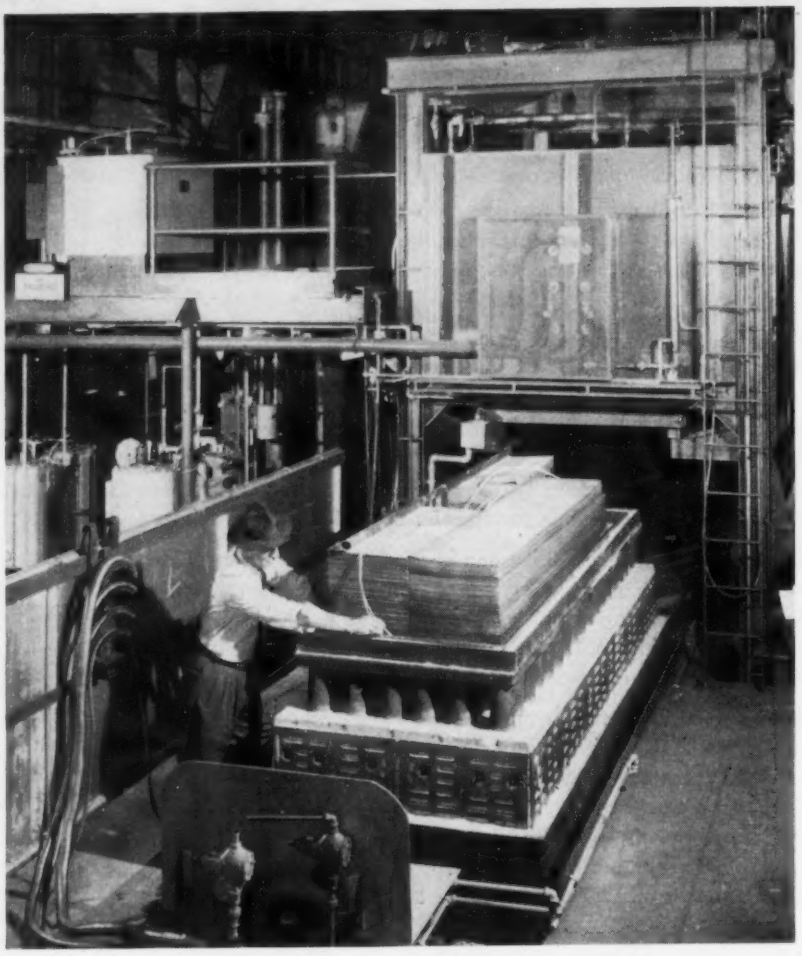
Export Regulations

Applications for licenses to export facilities for production of fissionable material, according to an announcement by the Office of International Trade, must be submitted to the Atomic Energy Commission in the manner prescribed by the commission. Copies of Form AEC-17 and complete information may be obtained from the Atomic Energy Commission, Washington 25, D. C.

Provisions of the OIT consolidated license procedure have been amended to provide that a separate consolidated license application must be submitted for each country in Group K for which authorization to export ⅛ to ⅓ horsepower motors is desired.

Brass, bronze, copper and zinc building materials have been removed from the consolidated license procedure and placed under individual license procedure. Purpose is to control country distribution of the limited quantities of these scarce materials for export.

The following commodities have been added to the Positive List of Commodities requiring a validated license for export: Mechanical vacuum pumps with theoretical displacement at normal speeds of 20 cubic feet per minute or more and capable of producing a vacuum of 1 millimeter of mercury pressure absolute; diffusion vacuum pumps 5 inches in diameter and larger; parts for the foregoing pumps; oils for diffusion pumps.



ELEVATOR FURNACE: Recently installed to increase production of large transformers and feeder regulators at Allis-Chalmers Mfg. Co., Milwaukee, is this electrically heated, 180-kw, 208-volt, three-phase high temperature elevator furnace. It will be used for tempering punchings of magnetic material in a hydrogen or nitrogen atmosphere up to a maximum temperature of 2150 F. Loading dimensions are 11 ft 8 in. long, 40 in. wide and 20 in. high. Two loading cars are provided, each having a driving motor so that the car can be run under the furnace for automatic raising into position, or run out from under the furnace

Reserve Officer Training

To add to the training of reserve officers who are employed in private industry, and unable to get away from their jobs for a lengthy period, the Industrial College of the Armed Forces will conduct a condensed version of its regular course in leading industrial centers starting in January. Each course will require two weeks, Mondays through Fridays, for four hours daily. The schedule is as follows:

New Orleans, Jan. 12-23; Birmingham, Feb. 9-20; San Francisco, Mar. 22-April 2; New York, Apr. 12-23; Pittsburgh, May 10-21; Chicago, June 7-18.

British Defer Reconstruction

Many domestic programs shelved to divert steel, labor, coal, etc. into intensified export drive. Preferential treatment to be accorded a few industries

BIRMINGHAM, ENGLAND

REDUCTIONS of £180 million are to be made in Britain's home capital expenditures so that more labor, coal, steel and other materials may be used to intensify the export drive.

Schemes to be shelved include a £4 million plan to rebuild Euston Station in London, 80 per cent of major road work, the Severn bridge, the Thames tunnel and most civil aviation construction work. Output of railroad coaches in 1948 will be limited to 1000. For the first half of 1948 steel for rails will be limited to 62,500 tons a quarter. The full railroad program of nearly 600 locomotives and 48,000 new freight cars, however, will be allowed to proceed.

Gas, Steel Industries Vital—Sufficient steel will be provided for the gas industry to enable it to meet its minimum requirements. In the steel industry the program for new facilities and major replacements to raise output to 15 million ingot tons a year is viewed as vital to recovery, and maximum increase in the shortest possible time is required. Production next year, however, is not likely to exceed 14 million ingot tons.

Demand for steel for export may increase. Currently, however, exports of iron and steel remain at a low figure in accordance with the government's policy of restricting such business in favor of the home market. Some increase may be looked for in exports of finished products rather than in primary iron and steel, which last month were the lowest for nearly two years and less than 50 per cent of the 1938 average.

Coal Output Short of Goal—Output of coal has reached 4,263,200 tons a week, but higher production is necessary if the target of 200 million tons this year is to be met. It is hoped export of coal can be resumed next year if output continues its upward climb.

In the shipbuilding industry merchant tonnage under construction is growing month by month and in October reached 1,944,000 gross tons against the previous month's record of 1,915,000. New vessels laid down totalled 126,000 tons in October, the best figure since September, 1946.

Progress is also being made by British automobile builders for the export program, and the number shipped in October was a record 14,186.

Pig iron production is rising but is still behind consumption in steelworks and foundries and inventories of iron and scrap are being reduced accordingly. More furnaces will be lighted when they can be assured of adequate coke supply, but an improvement in the flow of scrap is also necessary. Foundries cannot make their full contribution to the export drive until more iron is made available, and their backlogs of orders for light castings are substantial.

Rerollers are getting better delivery of billets and sheet bars, but they still have difficulty in maintaining regular operations. Producers of black and galvanized sheets are booked far in advance and will not take any new business for an indefinite period.

U. S. Shipments to Russia Exceed $93.7 Million

The United States during the first nine months of this year shipped more than $93.7 million worth of freight cars and farm and industrial machinery to Russia through direct exports and lend-lease arrangements, the Department of Commerce has revealed.

Lend-lease virtually stopped during the third quarter, the department's report indicates, and the Soviets' total shipments to us during that three-month period exceeded ours to them. Our shipments to them totaled $22.8 million during the third quarter, and their deliveries to us amounted to $26.5 million.

German Removals Too Drastic?

DUSSELDORF, GERMANY

GERMAN opinion as to the future effect of the current dismantlings of factories for the most part is favorable, and optimism for the reconstruction period still ahead is felt by many. That the outlook is brighter as the result of the dismantling program reflects the realization that with the dismantling lists now completed and with assurances from the Allies that the German people will not be burdened with an annual reparations charge their productive efforts can go into improving internal and external conditions.

This hopeful attitude, while applying generally to the program, does not exist in regard to the productive capacity of the iron and steel industry, however. The Germans view the facilities remaining when all dismantlings are completed as insufficient to permit an annual output of 10.7 million metric tons as set up under the revised production level.

Germans, British Clash—The British, in whose zone most German steel capacity is located, claim present capacity is 19.2 million tons of raw steel, which will be reduced to 13.1 million tons when dismantlings are completed. The facilities operating at 82 per cent of capacity would then produce the permitted annual steel tonnage.

German opinion, however, is that theoretical capacity will be only 9.9 million tons and that that tonnage can be produced only if high grade Swedish ore instead of low grade domestic ore is made available. Furthermore, they feel that because of necessary repairs this capacity cannot be utilized fully, and to keep production at the 10.7 million ton level a capacity of 13.4 million tons would be required. Recognizing the wide discrepancy between the two viewpoints, the British are again delving into the capacity problem.

Processing Facilities Reduced—On the basis of the dismantling list, losses in capacities for processing steel are as follows: Shapes 40 per cent, steel bars 20 per cent, strip 55 per cent, plates 65 per cent, sheets 12 per cent, wire rods 18 per cent, seamless tubes 46 per cent, welded tubes 54 per cent. The average capacity loss of all rolling mills would be about 35 per cent.

Losses in plate and tube capacities would affect German steel export trade seriously. Nearly 45 per cent of German pipe and tube production was exported before the war, and capacity for large diameter tubes would be almost entirely removed.

Electric furnace steels, too, would be produced in much smaller tonnages than during the war. As the plan now stands capacity will be limited to about 250,000 tons a year, as against 1.1 to 1.2 million tons during the war. Dismantling of Deutsche Edelstahlwerke, Krefeld, and of Gusstahlwerk, Bochum, the leading electric steel producers, would prevent Germany from making rolls for cold reducing mills, roller and ball bearings and other essential items.

By VANCE BELL
Associate Editor, STEEL

Radio Production Setting N

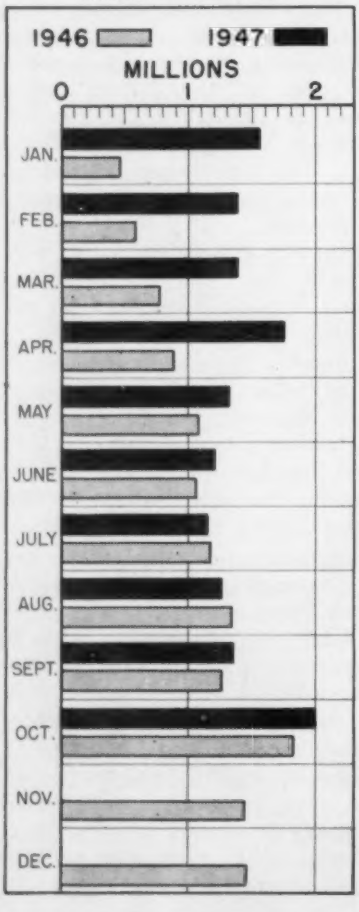
Output will approximate 16 million sets. With supply catching up with demand, outlook is for drop in 1948 production, although television is expected to gain

ENTHUSIASM for radio that once kept home-made crystal set fans up far into the night now is expressed in such a great demand for factory-made receivers that the radio manufacturing industry will set a new production record this year.

Although the industry has had some production problems, principally procurement of steel, transformers and fine console cabinets, it now appears its total output will exceed 16 million sets, compared with the previous record last year of 15 million with a manufacturers' value of $415 million.

However, production has caught up with demand, and supply pipelines are again fairly well filled. Consequently, some members of the industry think it will not be necessary for the industry to produce more than 15.3 million receivers next year, while others estimate the need at only 12.9 million. However, barring an unforeseen economic downturn, the dollar volume of next year's sales is expected to exceed that of 1947 because it is anticipated the 1948 output will include an increased percentage of the more expensive types of receivers—phonograph-radio combinations, FM (frequency modulation) receivers and television sets.

RADIO OUTPUT



Good Customer—To produce over 16 million sets in 1947, the radio industry consumed better than 64,000 tons of steel, principally in the form of stampings. Involving less tonnage but also serving vital purposes in radio set manufacture and providing an outlet for various products of the metalworking industry are aluminum, copper wire, solder, rivets and tubes. For some of the small, portable sets and automobile radios, steel and aluminum are utilized for cases.

During 1947, production of all types of sets by members of the Radio Manufacturers Association, Washington, has been as follows:

January	1,564,171	June	1,213,142
February	1,379,966	July	1,155,456
March	1,377,269	August	1,265,835
April	1,759,723	September	1,339,980
May	1,316,373	October	2,002,303
Total (10 months)			14,374,218

Analysis of the record-breaking demand for products of the radio manufacturing industry shows the high level of factory sales this year is principally due to: 1. Demand built up during the war when civilian radio production was suspended; 2. high number of homes established by war veterans; 3. gain in U. S. population from 131,669,275 in 1940 to 144,708,000 on Oct. 1, 1947; 4. continuing interest of consumer to have more than one radio in the home; 5. improvement in radios and added features such as FM and phonographs; and 6. ability of purchaser to pay price increases necessitated by a rise in production costs.

Table Models Lead—Of this year's sales, approximately 85 per cent have been table models (less auto radio sales). The balance was made up of consoles. Naturally, more small sets are sold than higher-priced receivers, but in terms of dollars and earnings as well as service rendered the consumer, console radio-phonographs are of great importance.

In summarizing the year's accomplishments of the radio manufacturing industry, one leading producer related that while the industry's ability to produce table models of all types has exceeded demand for the most of this year and continues to do so, output of consoles did not meet consumer demand until the third quarter of this year, principally because of the industry's inability to obtain sufficient quantities of cabinets. Nevertheless, one large company whose 1947 production is more than double its best prewar year says it still finds it necessary to allocate its entire output of radios.

Another large manufacturer of radios reports that console combinations with the ordinary AM (amplitude modulation), FM and automatic phonograph are in greatest demand today. The demand for table model receivers, according to that company, has dropped noticeably in recent months, and, furthermore, there is no demand whatsoever for straight AM console models without phonograph. Demand for automobile radios is excellent and exceeds supply.

FM Output Rises—Through October, 830,016 units, or 6 per cent of the industry's production, have been radio sets which include one or more FM bands.

Monthly breakdown of 1947 production of radio receivers incorporating both AM and FM is reported by the Radio Manufacturers Association as follows:

January	51,318	June	76,624
February	53,594	July	70,649
March	67,264	August	72,014
April	112,256	September	90,546
May	84,507	October	151,244
Total (10 months)			830,016

FM is increasing in importance and popularity as new stations go on the air, and it has the great advantage of being free from natural and man-made noise. However, it does not appear today that FM can completely replace the ordinary radio (AM), for it will be some time before the nation has anything approaching national coverage by FM transmitters. The best future of FM, according to Avco Mfg. Corp.'s Crosley Division, Cincinnati, seems to lie in purely local service broadcasting in cities. As Zenith Radio Corp., Chicago, sees it, "there will always be a need for powerful AM transmitters to carry service into remote regions not served by FM."

This belief is likewise expressed in comment by Farnsworth Television & Radio Corp., Ft. Wayne, Ind., that

New Record

"we do not believe that FM will supplant all AM sets, but it will be added to all receivers in which it has not been incorporated previously." Approximately 65 per cent of Farnsworth's console-combinations being produced today have FM as well as AM, and the percentage with these features is rising.

Comparisons Difficult—While radio prices, generally speaking, are higher now than before the war, it is difficult to make a comparison pricewise, inasmuch as the sets are not comparable in that today's models incorporate advantages that prewar models did not have.

Most radio manufacturing plants are on a one-shift, 40-hour week, although some report they are working two shifts in some departments, while one company is using three complete shifts in its automatic screw machine department.

Television Brightens—One field of the radio industry that is likely to see continued increase in activity is that of television. Production of television sets has been rising, and efforts to accelerate it probably will be made with increasing fervor as the market for radio receivers becomes saturated and sales taper off.

Produced in the first ten months of this year were 125,081 television sets, according to the Radio Manufacturers Association:

January ...	5,437	June	11,484
February ..	6,243	July	10,007
March	6,639	August ...	12,283
April	7,886	September .	32,719
May	8,690	October ..	23,693
Total (10 months).....			125,081

Production lines this year will have turned out in excess of 16 million radio receivers, a new high. Small sets, such as these pictured, were reported to have accounted for approximately 85 per cent of this year's sales. NEA photo

It is anticipated that a minimum of 400,000 sets will be produced next year and that the annual production rate in television should reach a million sets annually not later than 1950. Principal handicap to television is the extraordinarily high cost of programming, it being estimated that a weekly one-hour television show offering entertainment comparable to today's best radio shows would cost at least $10 million annually. Obviously, few if any advertisers can afford such expenditures, and therefore it is necessary to obtain other financial support. As a means of surmounting this economic problem, Zenith Radio Corp., Chicago, has been working out a new system of television, "phone vision," which will enable set owners to receive through their telephone systems top-flight entertainment (without commercials,) by paying a charge that would be added to the monthly telephone bill. The television set also would bring in free television.

Television Programs Improve—Also optimistic about the future of television is Philco Corp., Philadelphia, whose chairman, L. E. Gubb, said: "Day by day it is increasing in size, importance and popular appeal. The quality of programs now is far superior to what it was six months ago, and great additional progress can be looked for.

"We are just concluding the first real year of television production and sales, and probably 175,000 television receivers will go into service in 1947. Tremendous as this is, it represents only the beginning. Next year, 1948, should see the sale of at least 500,000 television receivers with a value of over $200 million."

Believing that demand for television sets will be in the ascendancy, the Farnsworth Television & Radio Corp., Ft. Wayne, Ind., plans to concentrate much of its production next year on television. Its table model video receivers have been on the market several months, and the company plans to introduce other models within the near future. Motorola Inc., Chicago, reports its outlook for television is very "bullish"; Majestic Radio & Television Corp., Elgin, Ill., says its outlook is excellent; and Stromberg-Carlson Co., Rochester, N. Y., states "television sales are almost sure to be a very important factor in our 1948 billing."

They don't pay off on DEADWEIGHT

When frame, body panels, fenders, wheels and other structural parts are made of N-A-X HIGH-TENSILE, a truck uses its horsepower to deliver goods, not deadweight. The high physical properties of N-A-X HIGH-TENSILE make possible weight savings up to 25% in section, yet maintain superior strength and have increased resistance to fatigue, corrosion, abrasion and denting.

On the job, the savings in pounds mean a savings in dollars. Gasoline economy is improved. Maintenance costs are reduced. Life factor is increased.

If you make a product that moves, it will move more efficiently and economically through the application of N-A-X HIGH-TENSILE. Good formability, excellent weldability and fine surface texture for finishing make N-A-X HIGH-TENSILE a great steel to work with, too.

MAKE A TON OF SHEET STEEL GO FARTHER

Specify—

N·A·X

HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Prospects bright for reaching 5,000,000-car year as Chrysler moves up production in closing weeks. Some plants to close for inventory between holidays

DETROIT

RACE for the 5,000,000-car year is in the home stretch and it looks like the favorite would make it, thanks to a last minute spurt by divisions of Chrysler Corp. Current estimates of eleven-months' assemblies of cars and trucks, including Canada, is better than 4½ million, leaving some 434,000 to be built this month to make the goal. In the first three weeks of December, output has come close to 347,000, leaving less than 100,000 to go. Since a number of plants will be down between Christmas and the New Year's day for inventory and since some others, Buick for example, closed last Friday for the balance of the year, it is not likely the seven remaining working days will produce much more than this number.

Chrysler Corp. operations have moved up snappily in the past two weeks, presumably as the result of a better intake of steel sheet and strip. Nine-hour shifts and Saturday work have been instituted in Plymouth, Dodge, DeSoto and Chrysler plants in a year-end flurry of production. Plymouth assemblies, for example, have been moved up close to 10,000 per week, highest level since before the war, and approaching the plant capacity.

Taper Off — On the other hand, General Motors' divisions have been tapering off December production, and most if not all units will be down during the holidays. Resumption is tentatively scheduled for Jan. 5, but Chevrolet, Pontiac and Oldsmobile probably will undertake a model changeover and could be delayed. The new models will carry only minor changes—grilles, moldings, instrument panels, upholstery and paint—and hence should involve no extensive delay.

Chrysler, incidentally, pushed ahead of Ford this month, for the first time in a long while. However, the year's total for the Rouge plant will be well ahead of Chrysler.

Ford Prepares for Changeover

Reports are current of warehouses around town being loaded down with sheet and strip for Murray Corp. of America and supposedly for eventual consignment to Ford in the form of fabricated parts. The story is that Ford is building up a bank of steel to make a whirlwind start on 1948 models this spring, and is seeking to persuade all suppliers to bulwark their inventories so no interruptions will be occasioned when the new models are rolling. It would appear likely a shutdown of several weeks, possibly a month, might be necessary for the extensive Ford changeover next year, since new models are being completely redesigned and will involve a lengthy coordination of manufacturing procedure before the new series is rolling smoothly. Hence the desire to insure no shortages of parts or materials because accelerated production will be necessary to make up for the time lost in changeover.

Extent of the forthcoming changes at Ford poses another problem in maintaining the supply of replacement parts for older models. Since these parts will largely be out of production, it is essential that banks be built up against future demands. These inventories will require not only considerable investment in materials but also the provision of a greatly expanded storage space. Purchase of a number of government buildings in the Rouge plant area might be explained as a move to set up such storage space for service parts inventory. At one time it was the plan to devote a portion of the recently acquired naval arsenal on Mound Road in Detroit to Ford service parts. This apparently has been changed and all the arsenal facilities will be given over to manufacture. Transfer of gear and axle production is already under way and there are grumblings heard from the UAW-CIO local at Ford over the evacuation from the Rouge. A recent issue of the union newspaper even raised the question of whether the removal of these operations could be made the grounds for strike action against the company.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1947†	1946†
January	366,205	109,910
February	393,636	101,637
March	443,588	134,071
April	445,137	229,867
May	404,191	263,445
June	421,466	217,943
July	400,944	315,963
August	364,478	358,457
September	444,501	339,774
October	461,536	406,561
November	419,621*	389,645
December		393,223
12 mos.		3,260,496

* Preliminary.
† All monthly totals revised to conform with statistics of Automobile Manufacturers Association.

Estimates for week ended:

Nov. 29	84,391	77,222
Dec. 6	110,759	93,907
Dec. 13	116,535	96,887
Dec. 20	120,000	96,754

Estimates by Ward's Automotive Reports

Builds 100,000th Engine

Kaiser-Frazer Corp. pointed with pride last week to the fact it had built its 100,000th engine at the former Continental Motors plant in Detroit which K-F took over on lease March 3. The plant was lagging behind desired output level early this year and Willow Run officials decided the only thing to do was to move in and take over the management. So their production genius, E. J. Hunt, was dispatched to the job and quickly reorganized the production facilities with the following results.

	Engines Per Month	Daily Average
March	5005	200
April	6208	238
May	8012	321
June	9514	340
July	9521	340
August	12,002	461
September	13,240	530
October	15,582	577
November	13,738	572
December (Est.)	15,000	650

That is a real production achievement in these days of castings shortages, deferred deliveries of machine tools and the lack of skilled labor. As usual, however, Eddie Hunt came through. Employment increased from 1876 on March 3 to 3350 currently, and the plant has operated continuously on a six-day three-shift basis. Purchase of a gray iron foundry at Dowagiac (facetiously referred to as

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

TRUCK CHASSIS CONVEYOR: Four and a half miles of overhead conveyors and one and a quarter miles of floor-type conveyors reduce manual handling of heavy equipment to a minimum in the new $7 million Ford Motor Co. branch assembly plant at Hapeville, Ga. Shown above is a section of the truck chassis conveyor

Dogpatch out at Willow Run) considerably eased the problem of castings procurement, although as yet there are no facilities in operation there for making cylinder blocks, which are furnished by Wilson Foundry in Pontiac.

New Dodge Trucks Shown

Premier showing of the new Dodge truck line was held last week, to be followed by public announcement next month. Included in the 1948 series are 248 (believe it or not) basic gross vehicle weight models, featuring modernized styling, greater ease of handling, all-weather ventilation, cabs with a claimed 360-degree vision, better weight distribution and reduced turning radius. The manufacturing problem involved in properly co-ordinating the flow of different parts in so many varied types of trucks can readily be appreciated, especially in view of the fact Dodge builds around 12,000 trucks a month.

Willys Earns $3,367,792

A financial statement which fairly glowed was released last week by Willys-Overland, disclosing a net profit of $3,367,792 for the fiscal year ending Sept. 30 on gross income of $138,791,292. Although this was a profit of only 2.4 per cent on gross business, still it was the company's best peacetime net since 1928 and reflects in major degree the management finesse of President James D. Mooney. The year's production total included 113,602 vehicles, of which 25 per cent were for export. They included jeeps, station wagons and trucks. In the next fiscal year, sights have been set on production of 200,000 and eventually, when supply conditions permit, the plant's capacity of 300,000 annually may be realized.

Willys' current assets increased to better than $53 million, or about half a million over the prior year. Inventories at Sept. 30 stood at about $16.6 million, or around $4 million better than in 1946. A $6 million increase in the company's plant and equipment account was indicated. Working capital, on the other hand was down about $4 million, reflecting the heavy investment in plant improvement.

Commenting on costs, Mr. Mooney told his stockholders that wages were increased 5.5 per cent last May, along with the granting of six annual paid holidays. Despite this, and higher materials costs, prices were raised an average of only 4.5 per cent, except for the jeep which has remained at the same price since November, 1946.

Pig Iron Next Bottleneck

STEEL'S survey of the pig iron situation last week has important automotive connotations, since cars and trucks are probably the largest single classification of gray iron castings users. It has long been recognized that the only reason more concern has not been voiced over the touch-and-go situation in pig iron for automotive foundries is that shortages of sheet and strip steel have been more critical. If steel had been plentiful, it is a sure bet the foundry would be the next whipping boy. In planning for a 10 per cent boost in production for 1948, a shortage of gray iron is immediately sensed, explaining why talk currently is being heard of switching transmission cases, cylinder heads, intake manifolds and axle housings to aluminum. The change, if indeed it becomes necessary, is regarded as only an expedient, since cost and strength factors are all on the side of gray iron.

Ford Dedicates Georgia Plant

Speaking at the dedication of a new $7 million Ford assembly plant near Atlanta, Henry Ford II pointed out that Ford products represent more than 36 per cent of the cars and trucks on Georgia roads today, reflecting in part the concentration which the elder Ford devoted to rural sections of the country. The old Model T Ford thus was designed specifically with the needs of the farmer in mind, while the original Ford tractor was preceded by $7 million worth of experimental work.

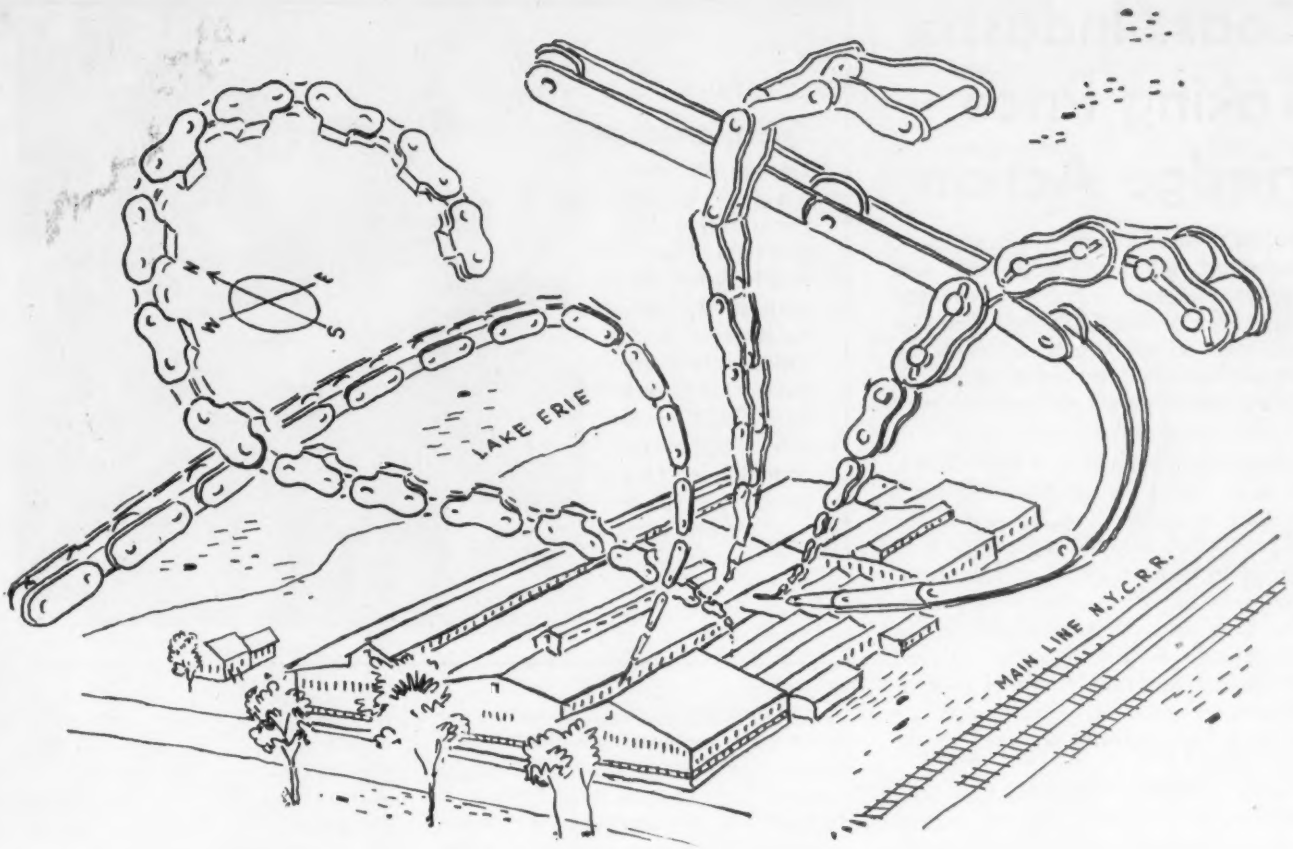
In the four years before the war, Ford bought an average of about $1 million worth of production parts, services and supplies annually in the South. Under current plans, the company hopes to boost this buy to around $8 million.

The new southern assembly plant is a single-story structure, covering 586,800 sq ft, and has capacity for 350 cars and trucks daily. Initial operations will be confined to trucks, with passenger cars coming along in the spring when new models are under way.

The plant boasts 4 1/2 miles of overhead conveyors and 1¼ miles of floor-type conveyors. Spray booths are of the latest downdraft type, built at a cost of $60,000 each.

Pontiac Pays Out $100,000

Pontiac Motor Division has kept in force its plant suggestion award plan started during the war, and since April, 1942, has paid out approximately $100,000 in government savings bonds for acceptable suggestions. Out of 8500 ideas submitted in the intervening 5½ years, approximately 25 per cent have warranted adoption. Average award has been $50.74, although four $1000 prizes have been presented. Diamond pins have been given to 17 employees each of whom has made five successful suggestions.



What's Interesting About UNION CHAIN'S Plant?

Union Chains for Every Application

Drive and Conveying Chains and Sprockets
- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

Finished Steel Roller Chains and Sprockets
- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

Silent Chain and Sprockets
- All sizes ⅜ in. to 1½ in. pitch

★

Flexible Couplings
- Roller chain type
- Silent chain type

Principally that it was built for the express purpose of manufacturing all types of Steel Sprocket Chains, Accessory Attachments, and . . . nothing else.

This distinction, however unusual in the chain industry, is of no consequence unless it means something to you as a user of chain. We believe that it does because it provides the twin benefits of economy and high quality resulting from specialization. Union's plant is a modern, one floor, straight line layout, which receives raw materials at one end and ships finished chain from the other in quantities which are constantly increasing.

If some of Union Chain's production is not already "tagged" for you, plan with us now for the day when it will be.

The Union Chain and Manufacturing Company

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS

Sandusky, Ohio, U.S.A.

Coast Industry Taking Price Hedge Action

SOME West Coast manufacturers, expecting more wage boosts and higher material costs, are booking long-term orders on what virtually amounts to an escalator basis by setting their prices for time of delivery. Firm prices are quoted only on short-term sales.

Explaining its policy in this regard, a large steel fabricating company in San Francisco, which specializes in production of steel pipe, says it is forced to protect itself on long-term contracts by not quoting firm prices. The firm adds that this practice is inescapable in the light of current conditions, but that it sticks to firm prices on short-term contracts or when it has material on hand to fill the order.

Others Follow Suit—Another San Francisco company, which makes castings, forgings and wheels, reports it has had to revert more and more in recent months to the sliding contract except on short-term orders which can be filled in perhaps a month or two.

Other companies which still are adhering generally to firm prices for most of their products complain they are being forced to change partially to the escalator basis because firms which supply them have changed to this system.

Can Work Both Ways — Many executives point out that the escalator clause can work both ways. In the event of a cost decrease, the lower expense factor can be passed along to customers almost immediately in the form of lower prices. They also say a sliding scale takes some of the force from another spin to the inflationary spiral. As an example, they indicate cases where companies have already prepared for wage increases not expected until next April or May by boosting prices now on long-term commitments.

SAFETY AWARD: George W. Hufnagle, of the Pennsylvania Department of Labor and Industry, presents safety certificates to J. Louis Irwin, safety engineer for Lukens Steel Co., Coatesville, Pa., in recognition of the company's safety record

Stewart-Warner Open House Marks Anniversary

Stewart-Warner Corp., Chicago, recently held an open house to mark the 35th anniversary of its founding.

Formed in December, 1912, by the merger of Stewart & Clark Mfg. Co., Chicago, and Warner Instrument Co., Beloit, Wis., the combine was originally called Stewart-Warner Speedometer Corp. to describe its principal business activity, the production of automobile speedometers. By 1929 the firm's name was shortened to its present form and its line of products had grown considerably to include speedometers and a variety of other automotive parts. Today Stewart-Warner's products also include aircraft equipment, home appliances and many other items.

Sheffield Steel Producing 35,000 Tons a Month

Steel production at the Houston, Tex., plant of Sheffield Steel Corp. has been stepped up to 35,000 tons per month and is now 150 per cent greater than originally planned when the mill was built in 1941.

This has been made possible through gradual expansion of facilities, the most recent being the construction of an open-hearth furnace. Fired recently, this open hearth gives Sheffield a battery of six utilizing scrap.

Material Handling Men Name Officers, Directors

Officers and directors for 1948 were elected at the annual meeting of Material Handling Institute recently at the William Penn Hotel, Pittsburgh.

Samuel W. Gibb, Yale & Towne Mfg. Co., Philadelphia, was re-elected president and H. A. Carter, Geneva Metal Wheel Co., Geneva, O., was re-elected vice president.

The board of directors is as follows: Mr. Gibb, chairman; Mr. Carter, vice chairman; L. C. Backart, Rapids-Standard Co. Inc., Grand Rapids, Mich.; W. Van C. Brandt, Electric Storage Battery Co., Philadelphia; J. H. W. Conklin, Clark Equipment Co., Buchanan, Mich.; L. E. Nivling, Lewis-Shepard Products Inc., Watertown, Mass.; W. G. Reycroft, Bassick Co., Bridgeport, Conn.; Frank F. Seaman, Robbins & Meyers Inc., Springfield, O.; L. West Shea, Union Metal Mfg. Co., Canton, O.; W. C. Stuebing Sr., Lift Trucks Inc., Cincinnati; J. Faulkner Thomas, Thomas Truck Caster Co., Keokuk, Iowa; and Roy L. Wolter, Automatic Transportation Co., Chicago.

Air Conditioning Group Holds Annual Gathering

National Warm Air Heating & Air Conditioning Association held its 34th annual winter meeting recently at the Hotel Cleveland in Cleveland.

Featured at the gathering were technical sessions, the introduction of a sales drive to launch a method of improving forced-air heating systems and election of officers. Continuous air circulation is the phrase used to describe the method introduced for adjusting present forced-air heating systems to achieve floor-to-ceiling warmth.

New 1948 officers for the association are: Atlee Wise, president; C. S. Franke, first vice president; W. D. Redrup, second vice president; and George Boeddener, managing director and treasurer. Members of the board of directors are: R. W. Blanchard, F. S. Boone, P. T. Cheff, E. B. Lau, C. B. Phillips, C. L. Rowley, A. L. Rybolt, A. W. Wrieden and F. E. Mehrings, ex officio.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

General Electric X-Ray Corp., Chicago, subsidiary of General Electric Co., has moved its Merchandising Department to 4855 W. McGeoch Ave., Milwaukee.

—o—

Westinghouse Electric Corp., Pittsburgh, reports plans to more than double its production of air conditioning equipment in 1948. Coincident with these plans is a program for new and intensive distribution of the equipment.

—o—

International Bank for Reconstruction & Development is sending a mission to Chile to make economic and technical studies relative to the Chilean loan application. The application relates to financing hydroelectric developments, forest industries, railway electrification, transportation facilities and port mechanization.

—o—

War Assets Administration is ready to receive proposals for the purchase of 10 Army ordnance works which originally cost the government about $500 million. Plants are at Point Pleasant, W. Va.; Sandusky, O.; Paducah, Ky.; Pryor, Okla.; Weldon Springs, Mo.; Baldwinsville, N. Y.; Youngstown, O.; Rosemont, Minn.; Baraboo, Wis.; and Meadville, Pa.

—o—

Todd Shipyards Corp., New York, has completed a two-year expansion program at the Union Industrial shipyard at Barranquilla, Colombia. Todd took over the management of this property after acquiring an interest in it two years ago.

—o—

Michigan College of Mining & Technology, Houghton, Mich., will offer an additional undergraduate degree beginning with the 1948-49 academic year. The degree is B. Min. E.—Bachelor of Mining Engineering.

—o—

Petrol Terminal Co., Philadelphia, has purchased from WAA a chemical plant in Beaumont, Tex., operated during the war by Magnolia Petroleum Co. for production of nitration grade toluene. Purchase price was $360,000.

—o—

DeVilbiss Co., Toledo, O., manufacturer of spray painting equipment and related items, announces that its spray painting classes for industrial finishers for the first half of 1948 will be held in Toledo in weekly sessions beginning Feb. 2, Mar. 1, May 10 and June 7.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, last week paid a special compensation payment for its eligible salaried employees. Bonuses to eligible personnel ranged from 25 to 50 per cent of the current monthly salary and did not exceed $500.

—o—

William Jessop & Sons, Sheffield, England, has closed its New York warehouse. Bulk orders for the company's tool steel may be placed at the English mill, while small quantity purchases may be made from James A. Coe & Co., Newark, N. J.

—o—

Dalc Bearings Inc. has been newly formed at 1974 Broadway, New York, to distribute ball and roller bearings and anti-friction products of SKF, Fafnir, Federal, Schatz and Timken bearing companies and Bunting Brass & Bronze Co. Offices will be opened Jan. 2.

—o—

Alabama announces that state production of coal for the first 10 months of this year totaled 14,377,000 tons, compared with 13,601,000 tons for the corresponding period last year.

—o—

Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has begun production of mineral wool at its two-cupola installation in North Birmingham. One cupola has been blown in. When the other goes in early in January, the two will produce about 60 tons a day from basic slag and coke.

—o—

Republic Steel Corp., Cleveland, has named Industrial Sales Co., New Orleans, as factory representative for its Berger Mfg. Division's product line of steel lockers, shelving, shop equipment and filing and storage cabinets.

—o—

Gray Iron Founders' Society, Cleveland, announces the formation of an Executives Group in the society. Chairman of the group is C. B. Shanley, secretary-treasurer of Semi-Steel Castings Co., St. Louis.

—o—

American Bronze Division of Metals Disintegrating Co., Elizabeth, N. J., manufacturer of metal powders, has sold property in Verona, N. J., comprising 56,000 sq ft of manufacturing space and 26 acres of land to Kusmick Development Corp., headed by Paul L. Kuzmick, Passaic, N. J., consultant in the field of abrasives.

—o—

Reed-Prentice Corp., Worcester, Mass., manufacturer of machine tools, has contracted to produce an offset printing machine for Lithomat Corp., Cambridge, Mass.

—o—

Bureau of Mines, Washington, reports that a good recovery of alumina—the material required in producing aluminum—has been obtained from diaspere clay deposits surveyed in central Pennsylvania and estimated to contain some 5 million tons.

—o—

Exhibitors Advisory Council Inc., New York, whose "Annual Schedule of Shows and Exhibits for 1948" has just been issued, lists 718 events for the first eight months of the year, as compared with 468 for the same period in 1947.

—o—

Power Crane & Shovel Association, New York, has completed a color strip slide film entitled "The Changing World" which describes functional design of power cranes and shovels, their application to construction jobs and job analysis. This film will be loaned free of charge.

—o—

Cleveland Twist Drill Co., Cleveland, has dedicated to the public five of its patents covering tools embodying hard nonferrous metal inserts such as may be formed of tungsten carbide.

—o—

New York Central and **Baltimore & Ohio Railroads** will open their $18,500,000 coal and ore docks at Toledo, O., next spring. Project was built jointly by the two railroads.

—o—

Export-Import Bank, Washington, announces credits amounting to $13 million have been made available to Nacional Financiera S. A., a financial agency of the Mexican government. Bulk of the credits will be used by Mexico to purchase processing plant equipment in the United States.

—o—

Western Society of Engineers, Chicago, has established a science and technical center in the Taylor Bldg., Randolph St., Chicago, for the use of professional persons, students and others.

—o—

Twin Coach Co., Kent, O., produced 160 motor coaches in November as compared with a record 231 in October. Decline is caused by the annual material inventory taken during one week in November.

The Business Trend

PACED by postwar peaks in several basic industries, industrial activity as measured by STEEL's index of industrial production in the week ended Dec. 13 pushed to the record level of three weeks earlier. At 171 per cent (preliminary) of the 1936-1939 average, the index reflects near-capacity operations in those fields not adversely affected by approaching winter weather.

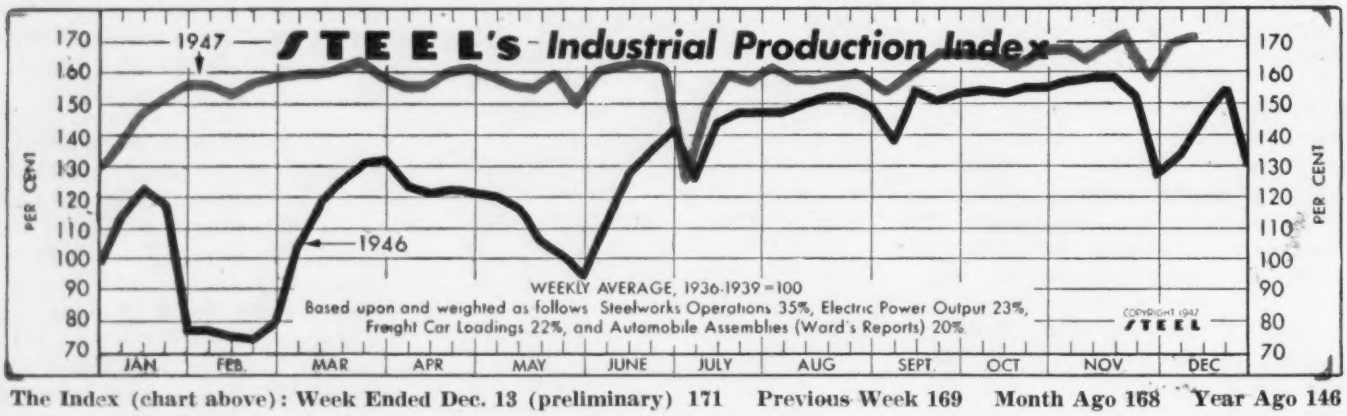
AUTOS—Bouncing sharply upward from the previous week's turn-out, output of cars and trucks in the week ended Dec. 13 was estimated at 116,535 units, a new postwar record. The pinch in ferrous metals for autobuilding, which still threatens production and is particularly critical in flat-rolled products, is now extending to cast iron components, and use of aluminum substitutes is being increasingly attempted. Indicative also of autobuilders' efforts to assure themselves of sufficient materials to meet their production schedules are the reported recent actions of several independents in dickering for steel producing facilities.

STEEL—The highest rate of steel operations in the nation's peacetime history was achieved in the week ended Dec. 13 when the ingot rate fractionally exceeded 97.5 per cent of theoretical capacity, and approximately 1,710,000 net tons of ingots were produced. However, with production constantly menaced by raw materials shortages and with long-deferred repairs becoming increasingly necessary, relief from the steel scarcity before mid-1948 is not expected.

ELECTRIC POWER—Consumption of electric power in the United States has reached 46 million kilowatts, an increase of 17 per cent over wartime high in 1944 when consumption was 39.4 million kilowatts, and, according to Federal Power Commission, supply will remain below demand throughout next year.

TRUCK LOADINGS—Volume of freight transported by motor carriers in October increased 13.5 per cent over September and 18.7 over October, 1946, according to American Trucking Associations Inc. The associations' index, based on tonnage moved in 1938-1940 as 100, rose to 245, an all-time peak. Carriers of iron and steel, who hauled about 2 per cent of total truck tonnage, reported increases in volume of 20.3 per cent over September and 31.6 per cent over October, 1946.

PRICES—Goods and services bought at retail by moderate-income families in large cities cost in the aggregate the same from mid-September to mid-October, Bureau of Labor Statistics announces. A decrease in food prices during that period was offset by rise in prices of other items, including housing, the index remaining at 163.8 per cent of the 1935-1939 average. Wholesale prices of all commodities in the week ended Dec. 6 continued their upward climb to a new high of 161.0 per cent of the 1926 average. Industrial raw materials and manufactured products also showed gains, being up 1.2 per cent and 0.5 per cent, respectively, from the previous week.



The Index (chart above): Week Ended Dec. 13 (preliminary) 171 Previous Week 169 Month Ago 168 Year Ago 146

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	97.5	97.5	97.0	72.5
Electric Power Distributed (million kilowatt hours)	5,327	5,218	5,084	4,778
Bituminous Coal Production (daily av.—1000 tons)	2,217	2,015	2,139	385
Petroleum Production (daily av.—1000 bbl.)	5,253	5,265	5,257	4,717
Construction Volume (ENR—Unit $1,000,000)	$95.6	$214.0	$159.3	$126.9
Automobile and Truck Output (Ward's—number units)	116,535	110,759	110,663	96,887

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

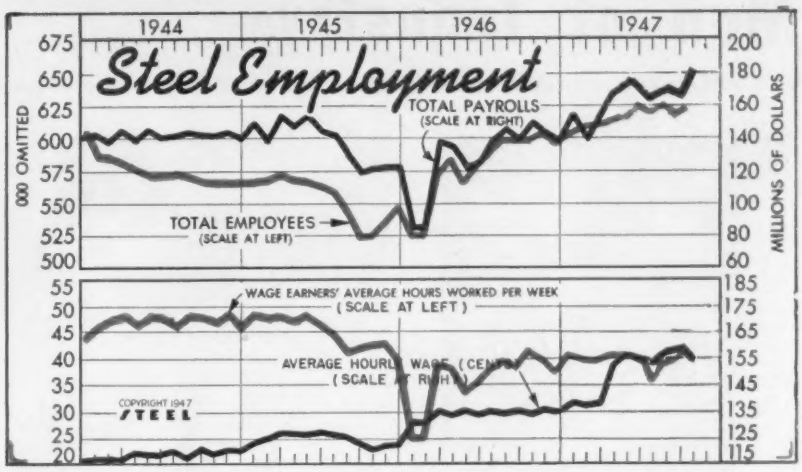
TRADE				
Freight Carloadings (unit—1000 cars)	855†	878	878	829
Business Failures (Dun & Bradstreet, number)	87	60	84	33
Money in Circulation (in millions of dollars)‡	$28,874	$28,817	$28,709	$28,946
Department Store Sales (change from like wk. a yr. ago)‡	+7%	+10%	+10%	+19%

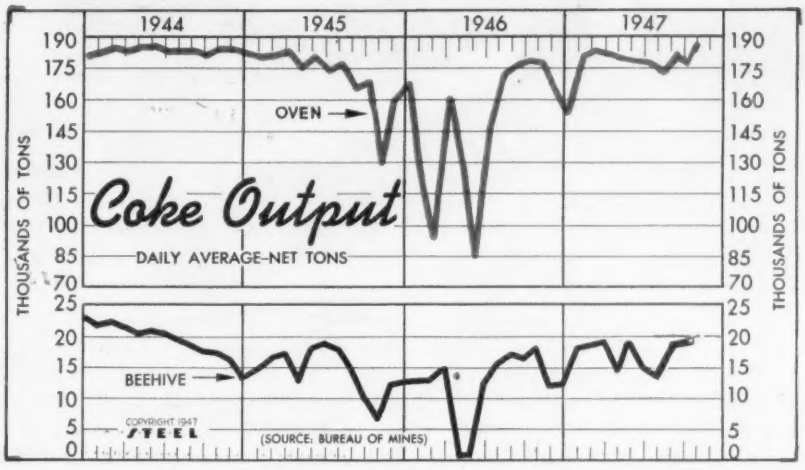
† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wage† (cents)	
	1947	1946	1947	1946	1947	1946
Jan.*	601	522	$155.8	$84.9	138.1	131.4
Feb.*	607	522	139.5	84.9	137.0	131.4
Mar.	609	570	150.6	138.8	137.9	135.1
April	611	582	168.3	134.3	153.3	134.1
May	615	563	175.8	121.4	155.6	135.8
June	623	578	167.6	125.6	154.7	134.4
July	623	585	163.2	138.0	153.9	135.1
Aug.	625	596	169.1	145.2	155.6	134.6
Sept.	618	596	168.9	139.6	157.1	136.2
Oct.	620	596	180.1	150.6	154.6	134.1
Nov.	...	600	....	143.4	....	136.7
Dec.	...	594	....	137.2	....	135.2

† Monthly average. * Figures for January and February, 1946, are merely averages derived from a report that combined those two strike-affected months.





Coke Output

Bureau of Mines

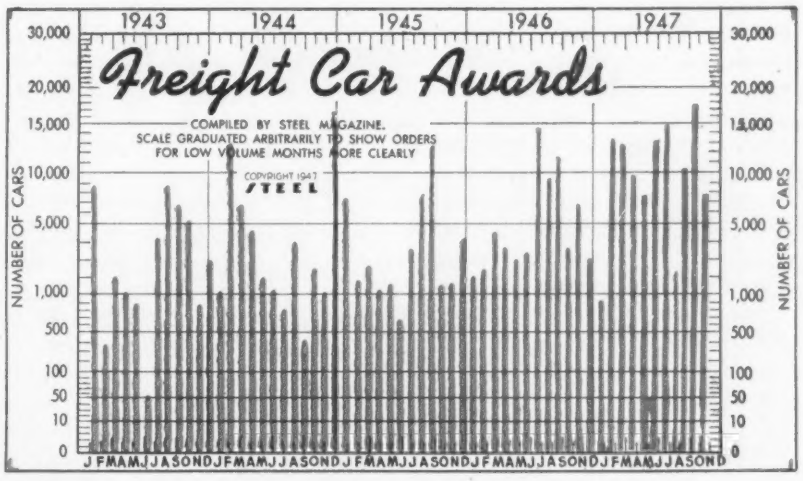
(Daily Average—Net Tons)

	Oven		Beehive	
	1947	1946	1947	1946
Jan.	181,245	122,570	18,124	13,093
Feb.	183,189	93,985	18,372	13,140
Mar.	182,529	161,290	18,725	14,962
Apr.	179,428	128,394	14,315	713
May	178,398	83,019	18,922	869
June	177,416	148,100	15,054	42,600
July	173,312	172,700	13,582	15,600
Aug.	181,697	177,300	18,346	17,400
Sept.	179,872	179,200	19,397	16,700
Oct.	187,009	178,900	19,786	18,500
Nov.	.....	164,165	.....	12,028
Dec.	.....	153,826	.....	12,302
Ave.	.....	146,877	.....	11,991

Freight Car Awards

	*1947	†*1946	1945	1944	1943
Jan.	9,172	1,481	7,200	1,020	8,365
Feb.	13,727	2,328	1,750	13,240	350
Mar.	12,049	3,512	2,500	6,510	1,935
Apr.	9,296	3,564	1,120	4,519	1,000
May	7,389	2,900	1,526	1,952	870
June	12,784	3,335	670	1,150	50
July	14,840	14,836	3,500	795	4,190
Aug.	2,372	9,527	7,240	3,900	8,747
Sept.	9,917	11,102	12,840	400	6,820
Oct.	17,737	3,407	1,320	2,425	5,258
Nov.	8,169	6,690	1,650	1,065	870
Dec.	.....	3,441	4,116	16,245	2,919
Total	.....	66,723	45,432	53,221	41,374

* American Railway Car Institute.
† Revised.


1943
1944
1945
1946
1947
Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS
FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1947
STEEL
NUMBER OF CARS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,652	$13,306	$11,419	$12,010
Federal Gross Debt (billions)	$257.7	$258.0	$258.6	$262.4
Bond Volume, NYSE (millions)	$34.2	$27.5	$20.7	$36.6
Stocks Sales, NYSE (thousands)	5,911	5,803	3,486	8,400
Loans and Investments (billions)†	$65.0	$65.0	$64.9	$57.6
United States Gov't. Obligations Held (millions)†	$37,560	$37,724	$37,982	$37,623

† Member banks, Federal Reserve System.

PRICES

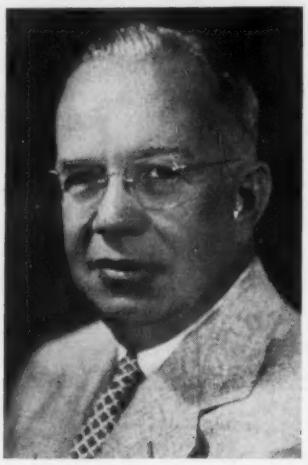
STEEL's composite finished steel price average	$76.09	$76.09	$76.09	$64.73
All Commodities†	161.0	159.8	157.9	139.1
Industrial Raw Materials†	180.0	177.9	175.2	154.4
Manufactured Products†	153.3	152.5	151.0	134.0

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

SAMUEL KOFFSKY

M. A. HUNTER



CHARLES F. NEWPHER

Samuel Koffsky, chief engineer of the Simmons Machine Tool Corp., Albany, N. Y., has been named general manager of the Simmons Fastener Corp., Albany. He will remain in charge of engineering of the parent company, Simmons Machine Tool Corp. **Robert L. Devitt** has been appointed manager of the New York office of the Simmons Machine Tool Corp. He formerly had been production manager of the company. In his new position Mr. Devitt succeeds **William Werley,** who will handle sales in southern territories.

—o—

Gerald Wilson, industrial engineer, has been appointed district contract manager for the eastern district by H. K. Ferguson Co., industrial engineers and builders of Cleveland, New York and Houston, Tex. Engaged in industrial engineering and construction activities for more than 20 years, Mr. Wilson has been new business representative for Ford, Bacon & Davis, New York, since 1939.

—o—

Curtis L. Williams has retired as traffic manager, West Virginia Steel & Mfg. Co., Huntington, W. Va., after serving in that position for more than 30 years. He is succeeded by **Herbert N. Hall,** who has been assistant traffic manager since last spring.

—o—

Goodyear Tire & Rubber Co., Akron, has appointed **R. L. Miller** assistant patent counsel. He previously had been resident attorney and assistant secretary for Goodyear Aircraft Corp., a company subsidiary.

—o—

C. C. Walker has been elected a commercial vice president, General Electric Co., Schenectady, N. Y., to be effective Jan. 1. He has been manager of the New England district in the company's lamp department since 1938, and will assume responsibility for customer relations in New England.

—o—

M. A. Hunter has been appointed general manufacturing manager of Federal-Mogul Corp., Detroit, manufacturer of automotive sleeve bearings and related products. Mr. Hunter became a director of the firm in January, 1946, and was made manager of the company's Greenville, Mich., plant in 1940. In his new position he will direct manufacturing operations in all of the company's plants.

—o—

Inland Steel Co., Chicago, announces the opening of a district sales office at Davenport, Ia., and the appointment of **John C. Veller** as district sales manager, effective Jan. 5. The office will be located in Suite 911 of the Kahl Bldg. Mr. Veller served as a representative of the Chicago district sales office, covering Michigan, when he first joined the company in 1943, and later was transferred to a territory which includes sections of Chicago and western Illinois. Prior to his Inland affiliation, Mr. Veller had been sales manager, National Steel Co., Chicago.

—o—

William M. Goss, vice president, Scovill Mfg. Co., Waterbury, Mass., has been elected president of the Copper & Brass Research Association. Vice presidents chosen are: **H. W. Steinkraus,** Bridgeport Brass Co., Bridgeport, Conn.; **S. H. Perry,** Chase Brass & Copper Co. Inc., Waterbury, Conn.; **G. D. Stearns,** Bridgeport Rolling Mills Co.; and **A. C. Wheeler,** Seymour Mfg. Co., Seymour, Conn. **F. L. Riggin,** Mueller Brass Co., Port Huron, Mich., was chosen treasurer.

—o—

Charles F. Newpher has been elected a director of Lock Thread Corp., New York. He is executive vice president and director of the National Screw & Mfg. Co., Cleveland. Mr. Newpher is a past president of the American Institute of Bolt, Nut & Rivet Manufacturers. He has been connected with the fastener industry for 35 years.

—o—

Hein-Werner Corp., Waukesha, Wis., has elected **Edward G. Bach,** manager, Hadcock Investment Co., a vice president, and **Robert I. Swift** a director of the corporation. Mr. Bach has been a director since 1946. Mr. Swift is division manager, Wisconsin Gas & Electric Power Co.

—o—

Hanson & Co., Detroit, manufacturer of precision gages, announces the appointment of **B. A. Johnston** as sales engineer on the products of the company.

—o—

Emmett M. Goodbar has been appointed division superintendent of maintenance, Pittsburg, Calif., plant of Columbia Steel Co., subsidiary of U. S. Steel Corp. He has been with the company since 1926.

—o—

Thermoid Co., Trenton, N. J., announces the following personnel changes: **Jack Brand,** formerly assistant sales manager, Automotive Replacement Division, will handle industrial sales for Colorado, with headquarters at Denver. **J. J. Chamberlain,** formerly associated with Pioneer

Get these facts about Electropolishing Stainless Steel Products

This may be an opportunity for you to cut polishing costs and give lustrous new sales appeal to your stainless steel products.

This improved process is called "Armco Electropolishing." It is a low-cost way to polish many stainless steel products in one operation by anodic treatment in an electrolytic bath. Parts with tiny recesses or of intricate design cannot escape the uniform polishing action of the chemical bath.

Armco Electropolishing has shown substantial savings for fabricators of practically all forms of ARMCO Stainless Steels, including wire, bars, forgings, sheets and strip.

If You Plate . . .

If your products are made of plated metals it may pay you to investigate the possibilities of ARMCO Stainless Steel—and the Electropolishing process. Many manufacturers have cut costs and made good products better by changing over to Electropolished stainless steel parts.

For more information about this cost-saving method of polishing stainless steels to a high luster, just fill in the handy coupon on this page. We'll send you a fact-filled folder on Armco Electropolishing titled "Polish Stainless Steels This Easy, Low-Cost Way." Mail it today! The American Rolling Mill Co., 329 Curtis St., Middletown, Ohio.

ARMCO ELECTROPOLISHING PROCESS

ARMCO

Send for this data folder

THE AMERICAN ROLLING MILL COMPANY
329 Curtis Street, Middletown, Ohio
Send me a copy of the folder titled "Polish Stainless Steels This Easy, Low-Cost Way."

Name _____ Title _____
Company _____
Street Address _____
City _____ Zone No. _____ State _____

Rubber Mills of California, and the Rubber Division, Paramount Mfg. Co., Detroit, will handle industrial sales in Washington state, and the northern half of Oregon, with headquarters in Seattle. **E. J. Dunlap** has been transferred from Trenton, where he headed industrial sales promotion, to San Francisco, where he will have charge of industrial sales for northern half of California and southern Oregon. **A. Fred Matheis,** who has been in industrial sales with Thermoid at Trenton headquarters for 20 years, assumes the duties of industrial sales promotion manager. **H. W. Overman,** manager, Industrial Friction Materials Division, has transferred his headquarters to the Detroit office, and will continue to direct industrial friction materials sales from that office. **Jack Wright,** who will have headquarters at Salt Lake City, has been assigned industrial and oil field sales in Utah, Idaho, Wyoming, Montana and western Canada.

—o—

Promotions in the Federated Metals Division, American Smelting & Refining Co., New York, include: **Louis D. Alpert,** named assistant to the Pacific Coast general manager; **John S. Selfridge Jr.,** promoted to superintendent, San Francisco plant; and **Robert C. Caldwell,** promoted to assistant superintendent of the same plant.

—o—

A. H. Timmerman, vice president, Wagner Electric Corp., St. Louis, received a certificate for 50 years of continuous service in the electrical industry from the National Electrical Manufacturers Association at a meeting recently held in Atlantic City, N. J.

—o—

A. A. Throckmorton has been made manager of scrap procurement for Kaiser Aluminum Division of Permanente Metals Corp., to be located at Oakland, Calif. He formerly was deputy director, Metal Division, War Assets Administration, and regional director of WAA's Region 2 in New York.

—o—

Dr. Richard L. Meier, research chemist, California Research Corp., has been appointed executive secretary of the Federation of American Scientists, to succeed **William A. Higinbotham,** who has become co-chairman, electronics department, Brookhaven National Laboratory, Upton, Long Island.

—o—

Ernest Murphy, president, Pressed Steel Car Co. Inc., Pittsburgh, has been named to the executive council, Federation for Railway Progress, Cleveland, to represent its railroad supplier members, and **A. L. Buxton,** president and director, Kentucky Chemical Industries Inc., Cincinnati, has been appointed to represent shipper members.

—o—

Richard P. Brown, chairman of the board, Brown Instrument Co., Philadelphia industrial instrument manufacturer, has been made a Fellow of the American Society of Mechanical Engineers.

—o—

Carborundum Co., Niagara Falls, N. Y., announces the following appointments to its sales organization, effective Jan. 1: **W. T. Cargo** has been named assistant director of sales in charge of operations in the western region. He will have headquarters in Chicago. **John S. Hawley** has been appointed assistant director of sales in the central region, with headquarters in Cleveland. **John G. Fritzinger** has been appointed assistant director of sales in the eastern region, with headquarters in Philadelphia. **R. R. Huntington,** previously a member of the company's staff at Cleveland, succeeds Mr. Fritzinger as district sales manager at Philadelphia.

—o—

Morris Sayre, president, Corn Products Refining Co., New York, has been elected president of the National Association of Manufacturers for 1948. He succeeds **Earl Bunting.** New directors-at-large are **John S. Coleman,** president, Burroughs Adding Machine Co., Detroit; **Ralph J. Cordiner,** vice president and assistant to president, General Electric Co., Schenectady, N. Y., and **J. Warren Kinsman,** vice president, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.

—o—

Emanuel J. Moskowitz, Schiavone-Bonomo Corp., Jersey City, N. J., has been elected president of the New Jersey Chapter, Institute of Scrap Iron & Steel Inc. He succeeds **Abe Goldberg,** Harry Goldberg & Sons, Perth Amboy, N. Y. Other officers elected are: First vice president, **George Rubine,** Hudson Iron & Metal Co., Bayonne, N. J.; second vice president, **Henry Fiestal,** Paterson Compressed Steel, Paterson, N. J.; third vice president, **Paul Giordano,** Giordano Iron & Metal Co., Trenton; secretary, **Murry Kunin,** Schiavone-Bonomo Corp.; treasurer, **Elie Bussel,** Plainfield Iron & Metal Co., Plainfield.

—o—

All officers and members of the executive committee of the Boston Chapter, Institute of Scrap Iron & Steel Inc., were re-elected at a recent meeting of the organization. **Frank B. Gordon,** Harcon Corp., Boston, re-elected president; **David Reisner,** first vice president; **Stanley Amidon,** second vice president; **Nathaniel E. Slavin,** secretary; **Sam Brier,** treasurer.

—o—

Joseph H. Nuffer, head of Air-Way Electric Appliance Corp., Toledo, O., has been elected president of the Vacuum Cleaner Manufacturers' Association. He succeeds **Bret C. Neece,** vice president, Landers, Frary & Clark, New Britain, Conn. Mr. Nuffer has been succeeded as vice president of the association by **George H. Scott,** president, Scott & Fetzer Co., Cleveland. Others elected to office are: **Walter K. Dietz,** president, Electrolux Corp., New York; and **A. L. Atkinson,** manager, Vacuum Cleaner Division, General Electric Co., at Bridgeport, Conn., both to membership on the executive committee of the association. **C. G. Frantz,** president, Apex Electrical Mfg. Co., Cleveland, has been re-elected secretary-treasurer, beginning

MORRIS SAYRE

JOSEPH H. NUFFER

Rolling Mill equipment

Year-in, year-out efficiency with minimum down-time; that's the true measure of rolling mill performance. And it's the yardstick that brings leading mill operators back to Bliss for their important sheet and strip mill installations.

No rolling mill requirement is too large—or small—for Bliss' extensive engineering and manufacturing facilities. Bliss builds two-, three-, and four-high mills for hot and cold rolling, single stand, reversing, or tandem operation on ferrous or non-ferrous metals. You can look to Bliss, too, for cluster mills and a complete range of accessory mill equipment including mandrel type hot mill coilers, upcoilers, slitters, reels, etc.

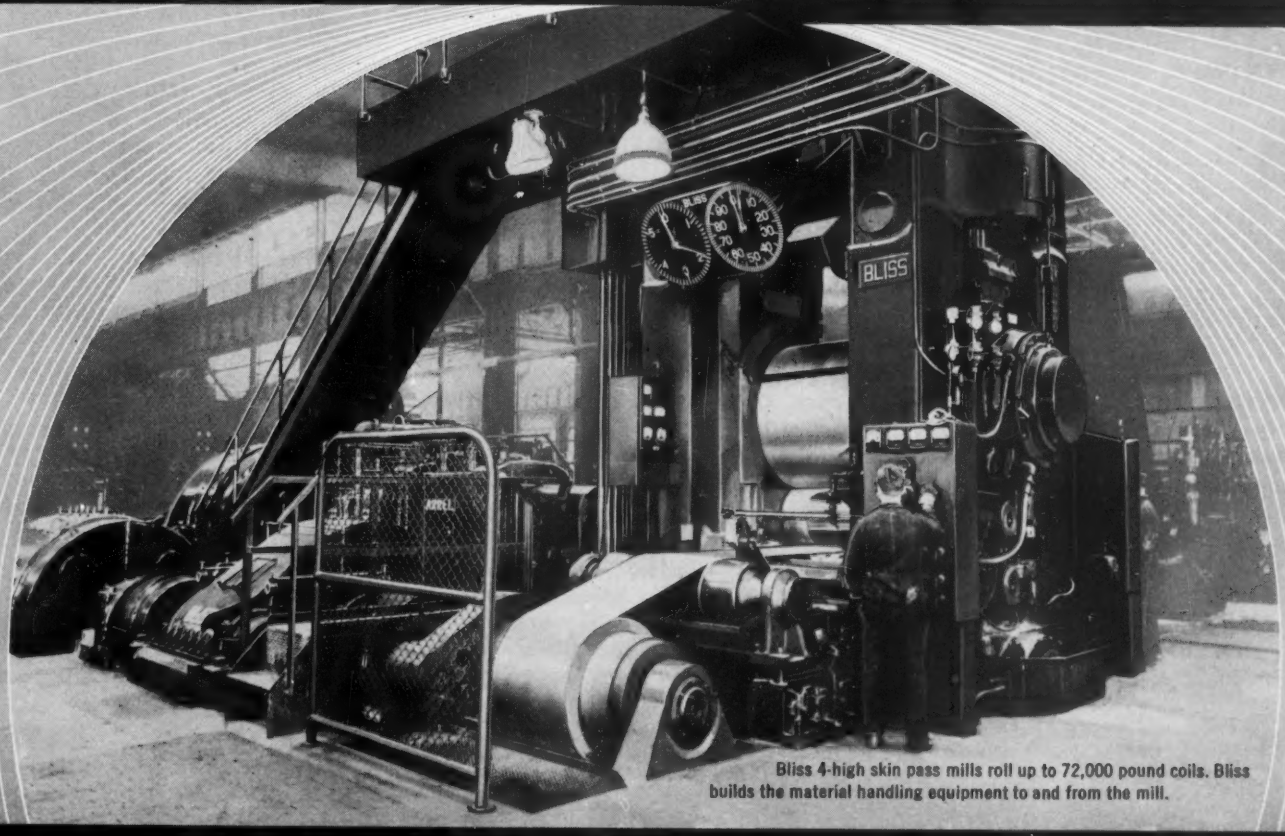
Have you a current rolling mill problem? Talk it over with Bliss.

with the long life-line

STAY AHEAD WITH *Bliss*

E. W. BLISS COMPANY
450 Amsterdam Ave
Detroit 2, Michigan

- rolling mills
- mechanical and hydraulic presses
- can and container machinery



Bliss 4-high skin pass mills roll up to 72,000 pound coils. Bliss builds the material handling equipment to and from the mill.

E. M. SARRAF

Appointed Cleveland district sales manager, Harbison-Walker Refractories Co., Pittsburgh. Noted in STEEL, Dec. 15 issue, p. 84

STEVE C. BROWN

Appointed advertising manager, American Hoist & Derrick Co., St. Paul. Noted in STEEL, Dec. 15 issue, p. 82

FRANK L. ESTEP

Appointed to supervise activities of the subsidiaries of Barium Steel Corp., New York. Noted in STEEL, Dec. 15 issue, p. 86

his 29th consecutive year in that post.

—o—

Alfred C. Baechlin has been appointed representative for Illinois Testing Laboratories Inc., Chicago, to handle the complete line of Alnor scientific measuring instruments on an exclusive basis in Phoenix, Ariz.

—o—

Glenn B. Warren has been appointed manager of engineering of the newly formed Turbine and Gear Divisions of General Electric Co., Schenectady, N. Y.

—o—

John R. Lill has joined the staff of L. S. Luther & Co., Washington representative of Liquid Conditioning Corp., Linden, N. J.

—o—

Joseph A. Sullivan has been appointed manager, advertising bureau, Universal Atlas Cement Co., subsidiary of U. S. Steel Corp., New York. He has also been appointed director of public relations. Mr. Sullivan succeeds the late **Max A. Berns,** publicity manager.

—o—

I. W. Preetorius will retire Dec. 31 as vice president and general traffic manager, General Box Co., Chicago. He has been associated with the company since its organization. **Nels E. Wikstrom** will succeed Mr. Preetorius.

—o—

Two appointments in the sales organization of Industrial Hydraulic Division, Sundstrand Machine Tool Co., Rockford, Ill., are: **P. A. Anderson,** Lakeville, Conn., has been appointed eastern sales representative, and the Burgan Machinery Co., Inglewood, Calif., has been named western sales representative.

—o—

Robert S. Ingersoll, formerly works manager for the Chicago and Kalamazoo, Mich., plants of Ingersoll Steel Division, Borg-Warner Corp., Chicago, has been elected vice president of the division, in charge of manufacturing at the Chicago, Kalamazoo, and Evansville, Ind., plants.

—o—

Appointment of **P. L. Edwards** as assistant manager of the central district office in Pittsburgh has been announced by Raybestos-Manhattan Inc., Manhattan Rubber Division, Passaic, N. J. He had been manager of the Products Division, western district. He takes over his new duties Jan. 1.

OBITUARIES

Norris R. Buckingham, 48, long associated with the drop forging industry, died in a Lansing, Mich., hospital, Dec. 12, from injuries received when his car was struck by a train. At the time of his death, Mr. Buckingham was vice president and general manager of Atlas Drop Forge Co., Lansing, where he had spent his entire business life.

—o—

Arthur P. Van Gelder, 74, retired general superintendent of high explosives, Hercules Powder Co., Wilmington, Del., died Dec. 10. He retired in 1921, following which he undertook the compilation of the history of the explosives industry. The volume was issued in 1927.

—o—

Edward A. Gray, former manager, Pyralin Division, E. I. du Pont de Nemours & Co., in New York, died Dec. 14 at his home in Ridgefield Park, N. J. He worked for the DuPont company for 23 years until his retirement in 1940.

—o—

Joseph M. Keogh, 81, former assistant to the general works manager at the Allis-Chalmers Mfg. Co., Milwaukee, died suddenly Dec. 10. He had retired in 1937 after 56 years with the company.

—o—

Herman V. Mills, 57, manager of the plant and property of the Wheeling Steel Corp., Wheeling, W. Va., died recently.

—o—

Harold G. Warr, 64, vice president in charge of engineering, P. & M. Co., and chief engineer, Poor & Co., both of Chicago, died Dec. 10 in Park Ridge, Ill. Associated with the former company 35 years, he was the inventor of a rail anchor and other railway track appliances. At the time of his death, Mr. Warr was a vice president of the Chicago Engineers Club.

—o—

Henry J. Hinde, 84, for many years until his retirement 15 years ago owner of the Toledo Machine Tool Co., Toledo, O., died Dec. 16 in a hospital in West Palm Beach, Fla.

—o—

Charles Donath, 64, president, Phoenix Brass Fittings Corp., Irvington, N. J., died Dec. 12 in Orange, N. J.

—o—

Harlan O. Robinson, 68, vice president, Coatesville Plate Washer Co., Coatesville, Pa., and affiliated with the company since its inception more than 25 years ago, died recently at his home in that city.

—o—

Joseph C. Davidson, 53, plant manager at Chester, Pa., of Ford Motor Co., Dearborn, Mich., died recently.

Engineering News . . . AT A GLANCE

ELIMINATES POROSITY—To improve the production of its heavy wall, cast iron thermocouple protecting tubes, Claud S. Gordon Co. recently developed a process that eliminates porosity in the castings by the addition of a small amount of alloy element. The Chicago firm reports the tubes are entirely free from usual defects generally found in most tubes of this type. The product is cast with both ends open and a special technique is employed for weld-closing one end.

PRACTICALLY UNDESTROYABLE—An exceptionally hard metal of a special cemented carbide composition developed by Kennametal Inc., Latrobe, Pa., is reported to withstand temperatures that rapidly destroy conventional carbides and some of the best cast alloys. When heated to 2100° F for 48 hours the material does not lose its strength, nor does it physically change appreciably when heated to 1800° F and quenched in water. Light in weight, the metal consists essentially of titanium carbide with cobalt as the bonding element. It also can be formed in a great variety of shapes and sizes.

JOINED TO STAY—Same process used by cutting tool manufacturers in attaching carbide tips to cutting tools is used by Atlas Welding Accessories Co., Detroit, in improving the construction of its chipping hammers. The company reveals that its forged hammer heads now are being drilled half way through and the handles silver brazed into the hole. End of each handle is machined to fit the base of the drilled hole so the silver flows, cementing the handle to the head over entire surface of the hole.

PROBE "INDUSTRIAL CANCER"—Metallurgists of SKF Industries Inc., Philadelphia, currently are concentrating on a drive to eradicate "Industrial Cancer"—studying baffling reactions in the crystals of steel which become "tired" due to stress and "irritations"—causing objects like auto axles, ball and roller bearings and other machine parts to fail. Just as body cells break up from cancer to cause human failure, the breaking up of basic crystals of hard metals, according to the company, accounts for more failures in modern engineering practice than any other single factor. The metallurgists are using, instead of white rats, a battery of 27 testing machines to determine the malady of metals.

"LEAK SNIFFER"—In checking the atom smasher's vacuum system for leaks recently, Westinghouse engineers in Pittsburgh enlisted the aid of an electronic leak detector capable of ferreting out a leak of air so tiny that it would take more than 3000 years to deflate an ordinary auto tire. Helium was first sprayed along every inch of the smasher's system—more than a quarter mile of surface. Then a special electronic tube was present to "sniff out" the helium in proportions as small as one part in 400,000.

RESISTS HEAT SCALING—Unusual resistance to heat scaling is provided in the mufflers currently being turned out by Buffalo Pressed Steel Co. Inc., for use by the automotive industry. In the construction of these units, the Youngstown, O., company uses aluminized steel supplied by Armco to obtain a combination of properties which neither the aluminum coating nor the steel base possesses alone. The coating provides corrosion resistance and attractive appearance of aluminum, while the core offers the tensile and yield strength of steel.

CHEWS STEEL BY CARLOADS—In a normal day's operation, the recently expanded Chevrolet-Indianapolis Division's plant which covers some 45 acres, consumes 16 carloads of steel, eight carloads of lumber and 7500 yards of upholstery fabric. Following this "masticatory" feat, the plant—devoted exclusively to manufacture of parts for commercial bodies—ships out 33 carloads and eight truckloads of components to 11 assembly centers around the nation (p. 62).

SLABBING PROCESS — In a new method of producing composite clad slabs used by Babcock & Wilcox Co., a fully fused bond of the clad material is obtained—one that does not have the objection of other similar fusion processes, which is an unevenness of the clad layer. The method is believed to be applicable to most all alloys and nonferrous materials (p. 64).

THE ELEMENTS "REIGN" — When selecting aluminum alloys for specific purposes, it is pointed out, a considerable number of elements can be used, including copper, magnesium, manganese, nickel, zinc and silicon, singly or in combination. These are employed chiefly to increase strength of the pure aluminum. The elements may be used in either wrought or cast alloys, essential difference being that wrought compositions contain smaller amounts of alloy additions (p. 67).

LUBRICATED WITH ALUMINUM — During wire drawing operations in the plant of Oliver Iron & Steel Corp., aluminum stearated powder is used to lubricate the wire while it is being drawn through the tungsten carbide sizing die of a Hogue machine. Wire enters the machine with a nominal size of 13/16-inch, but when drawn it measures about 0.790-inch, being round with a tolerance of 0.001-inch (p. 71).

TIMING IMPORTANT—To preserve the effect of hydrogen reduction during steelmaking, it is necessary to limit strictly the time spent in an inactive condition after boiling, and to insure that the ladle refractories are thoroughly dry, it is pointed out by C. E. Sims, assistant director, Battelle Memorial Institute, Columbus, O. Drying of furnace and ladle additions may give additional benefit (p. 74).

News Summary—p. 33 *Market Summary—p. 101*

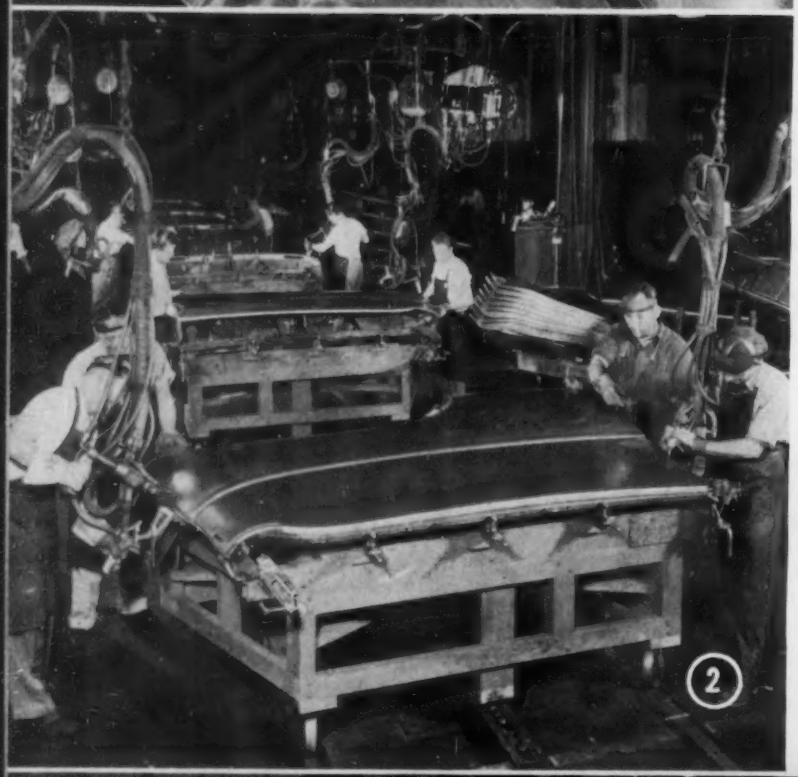
Latest Metalworking

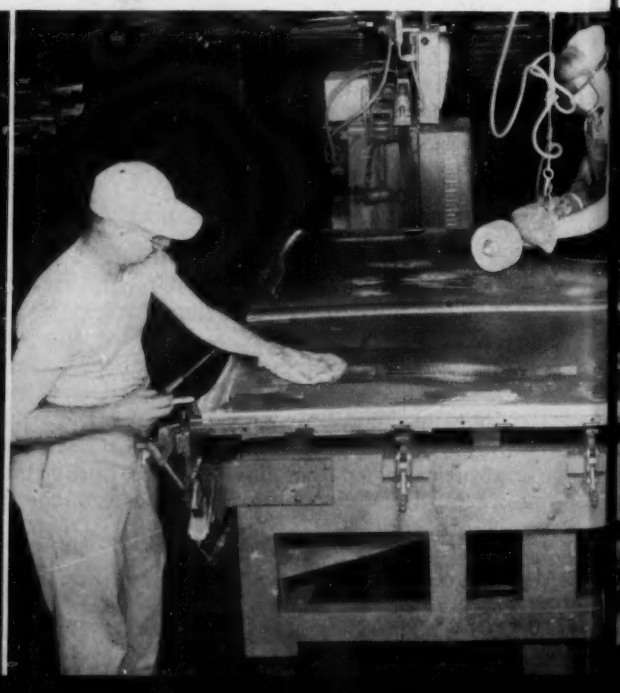
. . employed at new Chevrolet

EXPANSION of the Chevrolet-Indianapolis Division's plant, inaugurated shortly after the war, is now complete. The plant, as it now stands, represents three different steps. First came the purchase of the Martin Parry Corp. buildings in 1930, when Chevrolet decided that it could serve truck customers better by going into the commercial body building business.

Next step was taken in 1936, when the old buildings were torn down and replaced by a structure more suitable for the fabrication of welded steel body parts. At the conclusion of the war it was decided to expand facilities in order to meet the increased truck demand. Arrangements therefore were made to lengthen the pressed shop by 800 feet and put an 80-foot extension beyond to house a scrap baler. This made it necessary to raze the old office building and construct a new one, just recently completed.

As it now stands, the plant occupies approximately 45 acres of land, with slightly less than 900,000 square feet of manufacturing space and 60,000 square feet of office space. Devoted exclusively to the manufacture of parts for commercial bodies, which are shipped to Chevrolet's 11 assembly plants, it consumes in a normal day's operation 16 carloads of steel, eight carloads of lumber and 7500 yards of upholstery fabric, shipping 33 carloads and eight truckloads of parts.



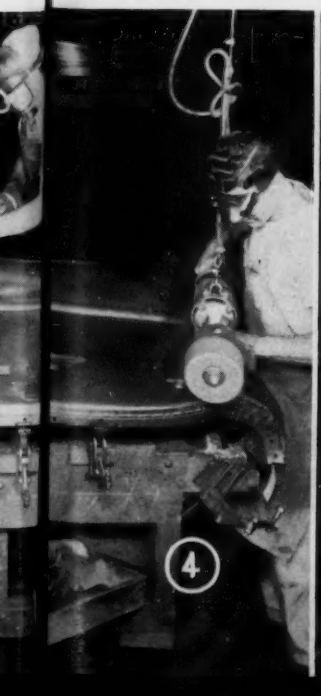


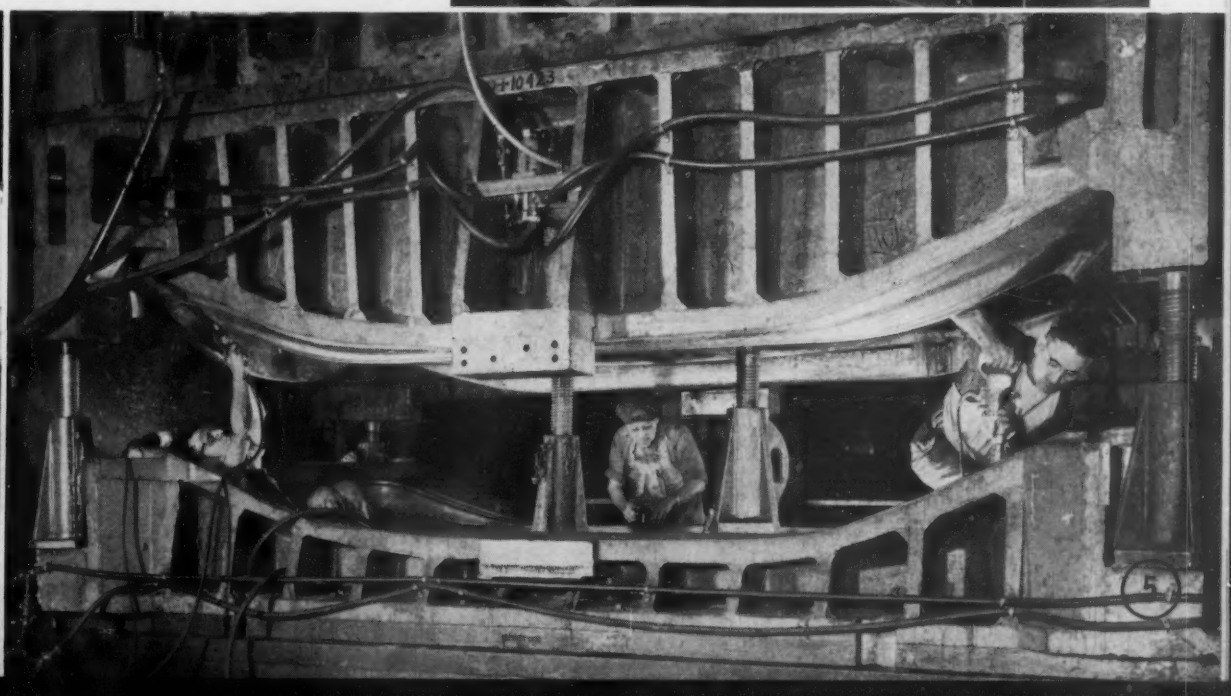
Equipment

Indianapolis truck plant

Fig. 3 shows five new toggle presses ranging in capacity from 900 to 1600 tons pressure. Here are formed inner and outer panels for panel truck bodies, also steel tops for these bodies. Die tryout men, Fig. 5, are shown "barbering" and smoothing a large steel top die, the two elements of which weigh close to 60 tons. Heavy jacks hold the dies apart. Bed area of this press is 90 inches front to back and 208 inches between uprights.

Surface of a large male die or punch for forming the entire side of a panel truck body is milled as shown in Fig. 1. Note sharp radius at fender well which calls for a high-grade deep-drawing steel for successful forming. Operators with portable grinders touch up rough spots in a side panel stamping, Fig. 4. Inspector at left uses cotton flannel, rough side out, to detect surface irregularities which he marks with the chalk in his other hand. Portable disk sander is used to touch up rough spots in surface of fender stamping for a cab-over-engine truck. Production line on the cowl top panel is shown in Fig. 7, beginning with flat sheet in background and moving progressively through series of presses to the formed and punched part in the foreground. To remove possible stresses originating in the deep draw on these cab tops, they are brought to the hammer shop where, with the aid of torches and pneumatic hammers, dings and other (*Pease turn to Page* 88)





Seam Welding

COMPOSITE P

Method of attaching alloy sheets to steel plates, using overlapping spot welds, proves highly successful. Here the author discusses equipment, applications and metallurgical considerations and describes briefly a new variation of the slabbing process

By O. R. CARPENTER
Babcock & Wilcox Co.
Barberton, O.

SUCCESSFUL manufacture of composite plates was the object of many patents and patent applications for the past 20 to 25 years. Review of the patents issued in this field gives one a good indication of the many schemes proposed. A knowledge of present day methods indicates how few of these met moderate success.

Resistance welding methods are generally familiar to most users of clad materials. Two variations of these methods are used. One is the use of spot welds which are made upon approximately 1-inch centers over the entire surface of alloy sheets assembled to a steel backing plate of the finish size. The second is the use of overlapping spot welds, or commonly called seam welding, for attaching alloy sheets to the finish size steel plate.

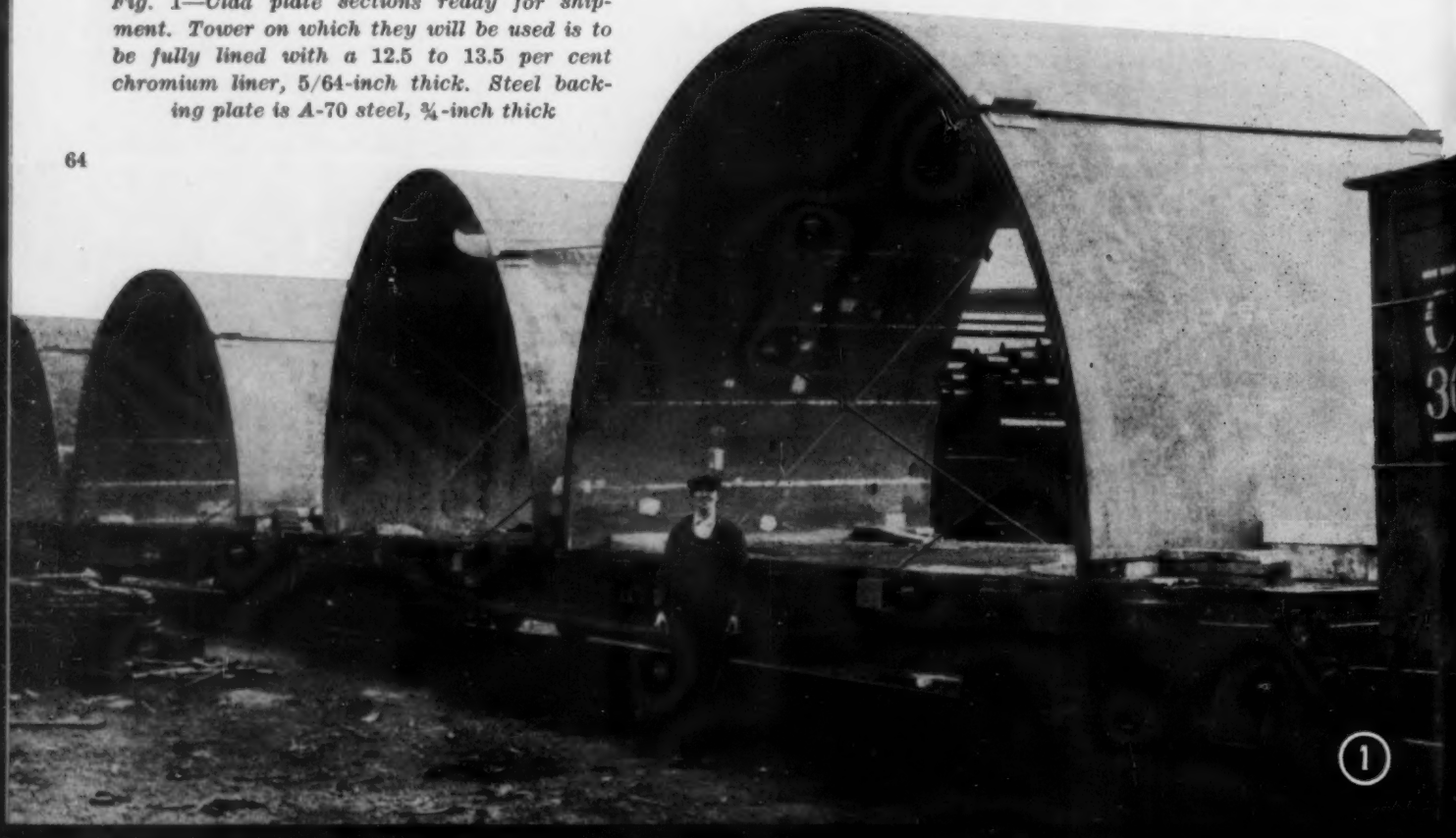
This latter method is used by Babcock & Wilcox. Use of overlapping welds gives an area of bond equal to approximately 75 per cent or more of the total. The spot welds overlap in the longitudinal direction of each seam. There is a slight separation of the fusion zones of adjacent seams or rows. Obtaining resistance welds on such close centers which are consistent in strength and penetration is rather an unusual problem in resistance welding. It may be of interest to discuss briefly the methods used to accomplish these results.

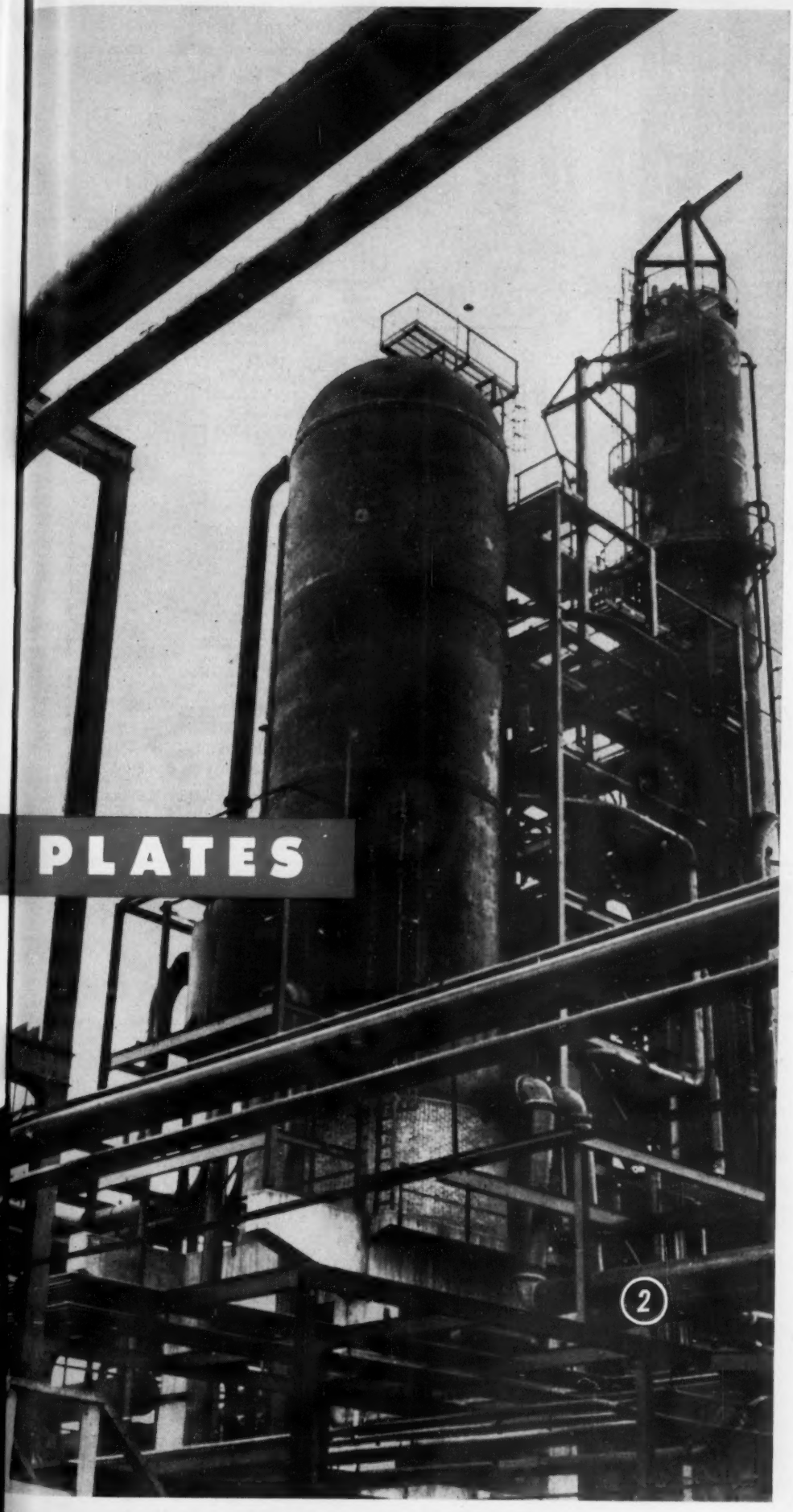
Seam Welded Clad Plates — Application of spot welds on close centers and over an extended area makes the problem of shunt currents a difficult one. Shunt current in resistance welding is the by-passing of a part or all of the welding current through completed welds rather than through the contact surfaces at the point of electrode pressure. Where shunt currents are excessive, poor or interrupted welding is experienced, and over-heating of the electrode contact surface takes place. Fig. 3 shows this condition diagrammatically.

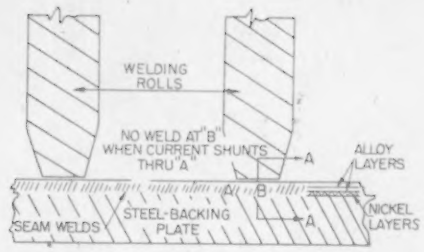
To overcome effects of shunt currents, one may open the spacing between individual welds to an extent where the current path through the completed weld is a higher resistant one than that formed under the electrode by the pressure and the contact of the clad material with the roll and the steel face. Or, if it is to be avoided on close center welds, the contact resistance between the roll and the alloy and the alloy and the steel must be reduced to a value low enough to give less voltage drop along this path than along that of the completed weld.

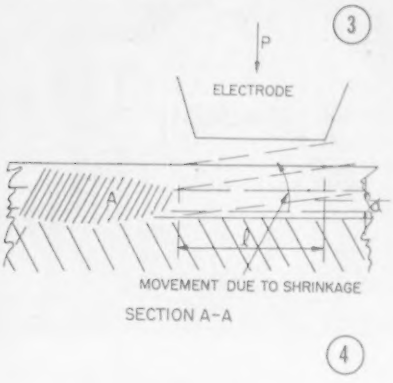
To accomplish this, other than by wide spacing of the welds, the problem becomes one of obtaining adequate pressure under the electrode adjacent to the completed weld. Fig. 4 illustrates the action of shrink-

Fig. 1—Clad plate sections ready for shipment. Tower on which they will be used is to be fully lined with a 12.5 to 13.5 per cent chromium liner, 5/64-inch thick. Steel backing plate is A-70 steel, ¾-inch thick









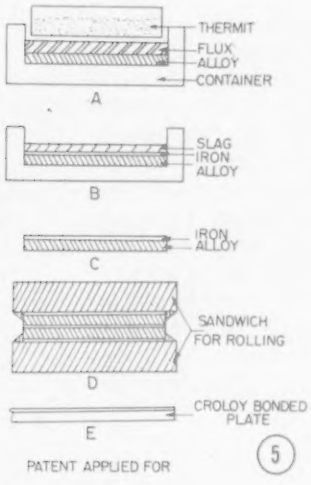


Fig. 2—Tower constructed with clad plate sections shown in Fig. 1. It has a 20-foot inside diameter and an overall height of 100 feet. Total weight is 150 tons

Fig. 3—Diagrammatic illustration of condition resulting from excessive shunt current; overheating of the electrode contact surface takes place

Fig. 4—Action of shrinkage stresses due to completed weld "A" in raising the alloy clad layer away from the steel

Fig. 5—Method for producing composite clad slabs for subsequent rolling into plates. When iron is deposited on the stainless or alloy plates, these are assembled with the steel slabs in contact with the iron face in a pack form as shown here

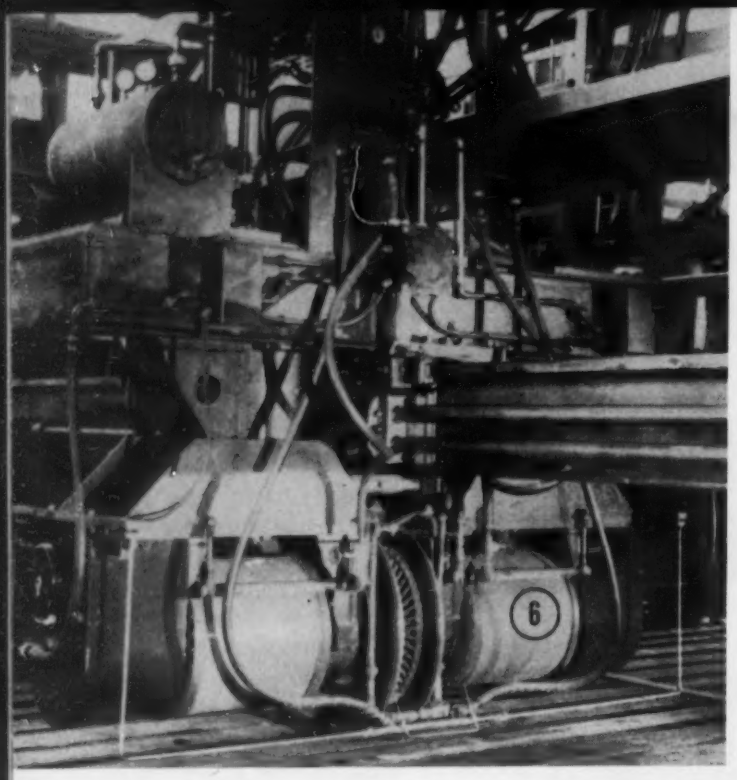


Fig. 6—New type welder developed by Babcock & Wilcox Co. for the manufacture of clad plates for pressure vessels. Operation of the welder is characterized by more consistent welding voltage, considerable savings and higher current flow into the work for shorter periods

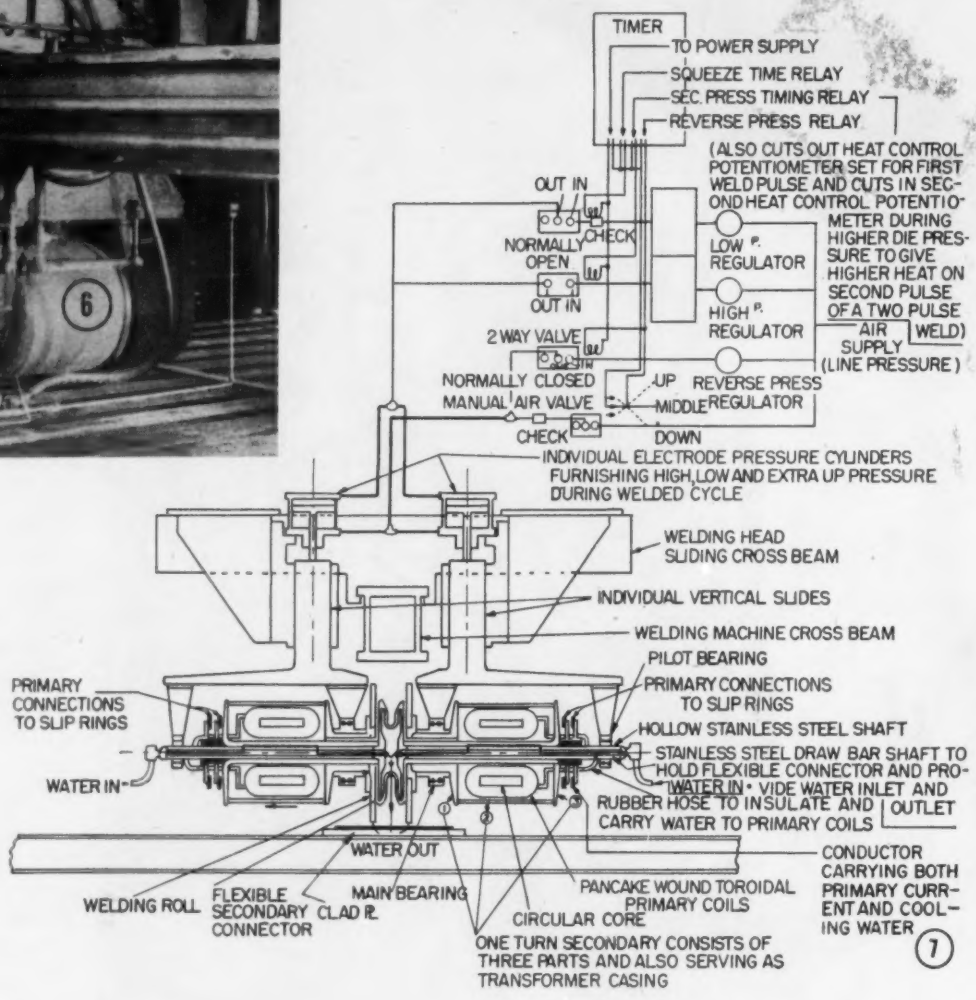

TIMER
TO POWER SUPPLY
SQUEEZE TIME RELAY
SEC. PRESS TIMING RELAY
REVERSE PRESS RELAY
(ALSO CUTS OUT HEAT CONTROL POTENTIOMETER SET FOR FIRST WELD PULSE AND CUTS IN SECOND HEAT CONTROL POTENTIOMETER DURING HIGHER DIE PRESSURE TO GIVE HIGHER HEAT ON SECOND PULSE OF A TWO PULSE WELD)
OUT IN
CHECK
NORMALLY OPEN
OUT IN
LOW P. REGULATOR
HIGH P. REGULATOR
AIR SUPPLY (LINE PRESSURE)
2 WAY VALVE
NORMALLY CLOSED MANUAL AIR VALVE
UP
MIDDLE
DOWN
REVERSE PRESS REGULATOR
CHECK
INDIVIDUAL ELECTRODE PRESSURE CYLINDERS FURNISHING HIGH, LOW AND EXTRA UP PRESSURE DURING WELDED CYCLE
WELDING HEAD SLIDING CROSS BEAM
INDIVIDUAL VERTICAL SLIDES
WELDING MACHINE CROSS BEAM
PILOT BEARING
PRIMARY CONNECTIONS TO SLIP RINGS
PRIMARY CONNECTIONS TO SLIP RINGS
HOLLOW STAINLESS STEEL SHAFT
STAINLESS STEEL DRAW BAR SHAFT TO HOLD FLEXIBLE CONNECTOR AND PROVIDE WATER INLET AND OUTLET
WATER IN
WATER IN
RUBBER HOSE TO INSULATE AND CARRY WATER TO PRIMARY COILS
WATER OUT
CONDUCTOR CARRYING BOTH PRIMARY CURRENT AND COOLING WATER
WELDING ROLL
FLEXIBLE SECONDARY CONNECTOR
CLAD PL.
MAIN BEARING
PANCAKE WOUND TOROIDAL PRIMARY COILS
CIRCULAR CORE
ONE TURN SECONDARY CONSISTS OF THREE PARTS AND ALSO SERVING AS TRANSFORMER CASING
7

Fig. 7 — General schematic diagram of welder shown in Fig. 6. Unit makes use of two rotary-type transformers in contrast to the conventional transformer which is stationary. Pulsating current to the weld is obtained by means of a pulsation timer

age stresses due to the completed weld "A" in raising the alloy clad layer away from the steel. When the distance between adjacent rows of welds or individual spot welds is small, the force required to replace the alloy in sufficient contact with the steel to overcome excessive shunt currents is great.

The cladding layer might be considered as a beam supported at weld "A", Fig. 4, and free on the other or opposite end. Force "P" required to deflect it then may be in proportion to the square of the alloy thickness. Therefore, an increase in the number of layers used to make up the alloy liner, as from one to two, will make the electrode pressure more effective in obtaining a low enough resistant path for the current to pass in this area in preference to the longer path through the finished weld. The clad layer is usually made up of three layers consisting of two of the alloy material and one of pure nickel.

Layers are separated at the edge to show the relative thicknesses of each. This type cladding makes use of the nickel inner layer for two basic reasons. It is an aid to the prevention of carbon migration, which will be briefly discussed later in this paper. The nickel also aids materially in increasing the total area bonded to the steel. The flexibility of the clad layers allows the welding pressure to be transmitted to the surfaces to be (*Please turn to Page* 83)

CHEMICAL AND PHYSICAL PROPERTIES OF CROLOY BONDED PLATE SLAB METHOD

Chemical Composition

	Face	Core	Face
Carbon	.050	.13	.050
Manganese	.67	.57	.67
Phosphorus	..	.013	..
Sulphur	..	.025	..
Silicon	.52	.085	.49
Chromium	18.29	..	18.37
Nickel	9.20	..	9.22

Bond Shear Tests 62,000 p.s.i.

Alloy Thickness .....19.9 to 22.2%
Total Plate Thickness..¾ inch

Physical Properties

Yield Strength 45,280
Tensile Strength 78,730
Elongation % in 2" 38
Rockwell Hardness B-84-86

By HERBERT DOBKIN
Consulting Engineer
Elizabeth, N. J.

Selecting ALUMINUM ALLOYS *for Specific Applications*

Knowledge of structures and formulations of commercial wrought aluminum alloys makes possible a more intelligent selection for various uses. Available information on these alloys is summarized here

A CONSIDERABLE number of elements can be used to form alloys with aluminum. They include copper, magnesium, manganese, nickel, zinc, and silicon singly or in combination. They are all used for the purpose of increasing the strength of the pure aluminum, and generally achieve this purpose through the formation of intermetallic compounds which stiffen the soft aluminum matrix.

These elements may be used in either the wrought or the cast alloys, the essential difference being that the wrought compositions contain smaller amounts of alloy additions. Increasing the amount of alloy increases the fluidity of the castings, but promotes hot shortness and poor rolling characteristics in the wrought alloys.

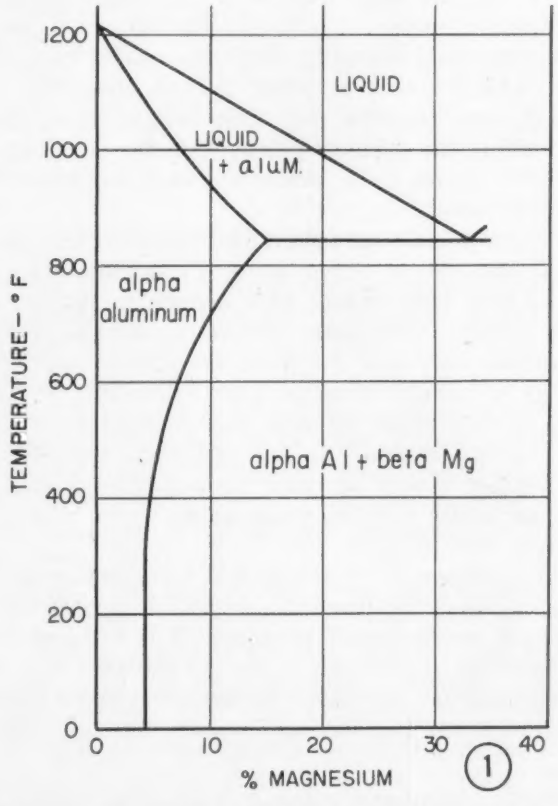


Fig. 1—Constitution diagram of aluminum-magnesium alloys

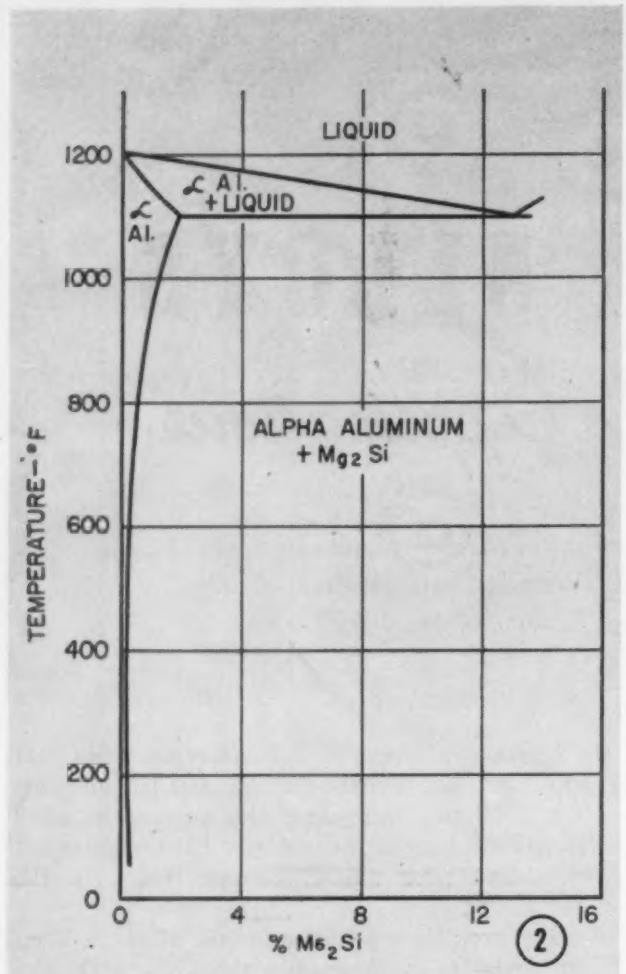
Of many possible types of wrought alloys, a number are found to be especially satisfactory from a commercial standpoint. The commercial alloys include the following compositions:

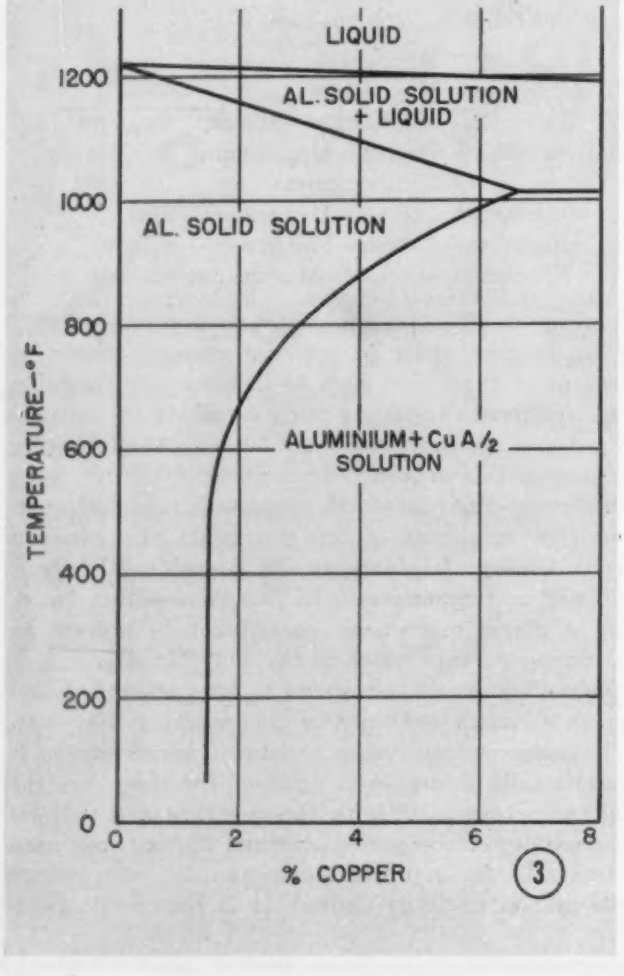
1. Aluminum—Manganese
2. Aluminum—Magnesium
3. Aluminum—Magnesium—Silicon
4. Aluminum—Copper—Magnesium—Manganese (Duraluminum)
5. Aluminum—Copper—Magnesium—Zinc
6. Aluminum—Copper—Manganese—Silicon
7. Aluminum—Copper—Magnesium—Nickel

Wherever possible, aluminum products are fabricated by working in order to increase strength. Some of these alloy types can also be hardened by suitable heat treatment. These and other details of the various alloy types are discussed more fully in the following sections of this article.

Aluminum—Manganese: Manganese is not used commercially in excess of 2.5 per cent; the common wrought alloy of this group, 3S, contains only about 1.25 per cent manganese. In this composition range only a single manganese constituent is present in the microstructure which is probably $Mn\ Al_3$.

This alloy does not respond to heat treatment and can be strengthened only by cold working. However, it has excellent corrosion resistance which makes it commercially desirable in spite of the fact that the manganese decreases both the electrical and thermal conductivity of the pure aluminum. 3S has been used extensively for pipes, kitchen utensils, etc., where moderate strength is desired. It is commonly avail-





able in the form of sheet, plate, wire, rods, bars, extrusions, tubing, pipe, and rivets. Typical physical and mechanical properties for this alloy are shown in Table I and II respectively. Chemical analysis is shown in Table III.

Aluminum—Magnesium: Aluminum and magnesium are completely soluble in the liquid state. A hard brittle constituent is formed upon solidification which is called beta magnesium and which has a composition believed to be Mg_2Al_3. As shown in Fig. 1, the constitution diagram for this series of alloys, a eutectic occurs at 33 per cent magnesium and 844° F. The magnesium alloys are lighter than aluminum and also have excellent corrosion resistance and machining qualities.

The common wrought commercial alloy of this group, 52S, contains only about 2.5 per cent magnesium. As can be seen from Fig. 1, it is a solid solution alloy which does not contain beta magnesium. However, its strength in the annealed condition is about double that of unalloyed aluminum (2S), and it also strain hardens more rapidly than 2S on cold working. It is used where fairly high strength is required, intermediate between 2S and the heat treatable alloys. It is commonly available in the form of sheet, plate, wire, rods and bars. Tubing and pipe are produced in a limited number of sizes. Typical properties and analysis for this alloy are shown in Tables I, II and III.

Aluminum—Magnesium—Silicon: These alloys can actually be considered as binary compositions of aluminum and the compound magnesium silicide, Mg_2Si, when the magnesium and silicon are present in the proper proportions. As shown in the phase diagram, Fig. 2, a eutectic occurs at 13 per cent Mg_2Si and 1103° F. As can be observed from the curved line in the left hand portion of the diagram below the eutectic temperature, the silicide compound shows decreasing solid solubility with decreasing temperature (1.85 per cent at 1103° F. and about 0.2 per cent at room temperature). This constitutional characteristic is the primary prerequisite for enabling all aluminum alloys to be hardened and strengthened by heat treatment.

The treatment used for all heat treatable aluminum alloys consists of three steps. First, the alloy is heated to a temperature high enough to put one or more of the constituents into solid solution—generally about 925—975° F. Next, the alloy is quenched rapidly, generally in water kept below 200° F. This rapid quench holds the dissolved constituents in supersaturated solution. In the last step, the alloy is aged either slowly at room temperature or rapidly at same mildly elevated temperature in the neighborhood of 350° F.

Aging promotes submicroscopic precipitation of the constituents in the form of a critical dispersion which increases strength and hardness. It is believed that the increase in strength is due to the fact that the precipitates act as "keys" between the shear planes and inhibit slip between the crystals. An alloy whose

Fig. 2—Constitution diagram of aluminum-magnesium-silicon

Fig. 3—Aluminum rich portion of aluminum-copper constitution diagram

TABLE I

TYPICAL PHYSICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS

Alloy	Density lbs/cu in.	Electrical Conductivity % of Copper	Thermal Conductivity at 100° C C.G.S. units	Coefficient of Thermal Expansion per °F (0-600° F) x 10^{-6}
2S-O	.098	59	0.54	14.4
3S-O	.099	50	0.45	14.4
3S-H	.099	40	0.37	14.4
A 51ST	.097	45	0.41	14.1
52S-O	.096	40	0.37	14.1
52S-H	.096	40	0.37	14.1
53ST	.097	40	0.37	14.1
14ST	0.101	40	0.37	13.8
17ST	0.101	30	0.28	13.8
18ST	0.101	40	0.37	13.8
24ST	0.100	30	0.28	13.8
25ST	0.101	40	0.37	13.8

DESIGNATIONS O—Annealed
H—Rolled—full hard
T—Solution treated and aged

TABLE II

TYPICAL MECHANICAL PROPERTIES OF WROUGHT ALUMINUM ALLOYS

Alloy	Ultimate Strength psi	0.2% Yield Strength, psi	Elongation % in 2"
2S-O	13,000	5,000	40
3S-O	16,000	6,000	35
3S-½H	21,000	18,000	12
3S-H	29,000	25,000	8
52S-O	29,000	14,000	30
52S-½H	37,000	29,000	12
52S-H	41,000	36,000	8
A51ST	47,000	40,000	20
53ST	38,000	33,000	17
14ST	70,000	55,000	14
17ST	60,000	40,000	20
18ST	61,000	47,000	17
24ST	68,000	46,000	20
Alclad 24ST	64,000	43,000	18
25ST	55,000	35,000	18
75ST	80,000	72,000	13

DESIGNATIONS
O—Annealed
½ H—Rolled—½ Hard
H—Rolled—full hard
T—Solution treated and aged

TABLE III

TYPICAL COMPOSITIONS OF WROUGHT ALUMINUM ALLOYS

Alloy	Percent of Total Copper	Silicon	Manganese	Magnesium	Nickel	Zinc	Aluminum
2S							Balance
3S			1.25				Balance
A51S		1.0		0.6			Balance
52S				2.5			Balance
53S		0.7		1.3			Balance
14S	4.4	0.8	0.8	0.4			Balance
17S	4.0	0.6	0.7	0.5			Balance
18S	4.0	0.75		0.5	2.0		Balance
24S	4.5		0.6	1.5			Balance
25S	4.5	0.8	0.8				Balance
75S	1.5			2.5		5.5	Balance

constitution does not show decreasing solid solubility with decreasing temperature can not be hardened in this manner.

The aluminum-Mg_2Si alloys have good corrosion resistance and are readily forged and worked. These properties combined with the moderately high strengths available through heat treatment make these types of alloys popular for many applications. They are used extensively for fittings in the dairy and brewery industries.

Commercial alloys in this group include A51S and 53S. A51S is normally used only for forgings. However, 53S is produced in all standard forms including sheet, plate, wire, rods, bars, rolled and extruded shapes, tubing, pipe, rivets, and forgings. Typical properties for these alloys are shown in Tables I and II. Typical chemical composition is shown in Table III.

Aluminum—Copper—Magnesium — Manganese (Duraluminum): Copper is one of the most widely used alloying additions for aluminum. It is generally kept below 4.5 per cent in wrought alloys in order to provide good working properties. These alloys attain high strength properties, which is the main reason for their popularity, although copper tends to inhibit corrosion resistance, and the corrosion resistance of these alloys can be classified as only fair.

The constitution diagram for aluminum-copper is shown in Fig. 3. This diagram shows only the aluminum-rich portion of commercial interest. Actually, a compound, Cu Al_2, is formed with a eutectic at 33 per cent copper and 1018° F. As can be seen from Fig. 3, the solid solubility of copper in aluminum decreases with decreasing temperature, indicating that the alloy is susceptible to heat treatment. It is the heat treatment, of course, which promotes the high mechanical properties. During heat treatment, the matrix is strengthened by solution of some copper, and the brittle Cu Al_2 compound is removed from the grain boundaries, thereby improving ductility.

The term duraluminum has been applied rather loosely to a general class of strong alloys containing about 3.5-4.5 per cent copper and up to about 1 per cent of manganese and magnesium. The most common alloy of this type is 17S. Slight modification in composition results in the alloy 24S. 14S alloy is similar to 17S and 24S except for the addition of about 0.5 per cent silicon.

First two alloys are normally age hardened at room temperature after solution treatment, while 14S is artificially aged at about 350° F. 17S age hardens so rapidly that cold working must be carried out within about an hour after solution treatment. Rivets, for example, must be headed within an hour if kept at room temperature but can be kept for about 0.5 per cent silicon.

A rapid quench from the solution temperature is essential for good corrosion resistance. When rapidly quenched, structures are essential solid solutions except for some insoluble Al-Cu-Fe-Mn constituents. The normal heat treated structure of 24S alloy (24ST) is shown in Fig. 4. When the alloy is cooled slowly from the solution temperature preferential precipitation occurs along the grain boundaries in the form of fairly large and numerous particles. The structure of 24S alloy cooled in still air is shown in Fig. 5. This precipitate exerts an adverse effect on corrosion resistance, particularly intergranular corrosion.

These alloys are used for many applications where high strength is required. Typical properties are shown in Tables I and II. For applications where increased corrosion resistance is required, "alclad" process may be used. This process is described more fully below. 17S is produced in all commercial forms including sheet, plate, wire, rods, bars, rolled and extruded shapes, tubing pipe, rivets, and forgings. 24S is normally produced in all these forms except rolled shapes and forgings. However, alclad 24S is produced only in sheet and plate. 14S is normally used only as forgings.

Aluminum—Copper—Magnesium—Zinc: Zinc is very soluble in aluminum and aluminum-zinc alloys were used in the early days of the aluminum industry and showed excellent strengths. However, zinc

affects corrosion resistance even more adversely than copper and also has a high specific gravity. At present, therefore, no commercial alloys are made of just aluminum and zinc.

Some of the highest strength alloys can be produced by additions of both copper and zinc to aluminum. The structure consists of the compound Cu Al_2 and an Al-Zn solid solution. The solubility of zinc is not greatly affected by copper. These alloys can be heat treated to a tensile strength of about 80,000 pounds per square inch.

The commercial alloy in this group is 73S. It is artificially aged at about 250° F to produce the best combination of strength and ductility; however, its strength decreases rapidly with increasing temperature. Corrosion resistance of 75S is poor, and it is generally produced in the alclad form in sheets and plates. Properties and analysis of this alloy are shown in Tables I, II and III.

Aluminum—Copper—Manganese—Silicon: This type of alloy is similar to duraluminum except that it contains no magnesium. The commercial alloy of this group, 25S, is widely used.

This alloy can be heat treated to high strengths, similar to duraluminum. Its corrosion resistance is not quite as good as that of duraluminum, but it can be worked more readily, and finds application where good working characteristics are desired, as in forgings. The properties and analysis of this alloy are shown in Tables I, II, and III.

Aluminum—Copper—Magnesium—Nickel: This series of alloys is quite important, especially for applications where high temperature strength (up to about 400° F) is required. These alloys form a ternary Al-Cu-Ni constituent in addition to Cu Al_2, Ni Al_3, and possibly others.

No binary alloys of aluminum and nickel are used commercially since they cannot be heat treated and since they show poor corrosion resistance. The addition of copper make the alloy heat treatable, and the addition of magnesium also aids in developing high hardness on heat treatment. The magnesium content is maintained at about 0.5 per cent in the wrought alloys to promote good forging characteristics.

Commercial alloy in this group is 18S. It is used mainly as a forging analysis, and many forged pistons have been produced in this composition. Properties and compositions of this alloy are shown in Tables, I, II and III.

As indicated above, some of the high strength copper alloys such as duraluminum and 75S show rather poor corrosion resistance. A process called alclad has been developed for protecting alloys of this type whereby each side of the alloy sheet is coated with a layer of high purity aluminum. The coating used is fairly thin, and the effect on overall strength is small. Advantage is taken of both the higher solution potential and the covering action of the coating in order to inhibit corrosion of the core. This process yields a product which combines high strength and good corrosion resistance.

The alclad product is not so sensitive to slow cooling after solution treating as the unprotected alloy, and slower quenching rates can be used to minimize buckling and distortion. However, during solution, there is a tendency for copper and magnesium to diffuse into the pure aluminum layer. The extent of the diffusion zone formed in this manner depends upon the temperature and time of the solution treatment. Care must be taken to prevent diffusion to the outer surface of the coating if maximum corrosion resistance is to be maintained. Fig. 6 is a photomicrograph of a cross section of alclad 24ST showing the core, the diffusion zone, and the high purity aluminum surface layer.

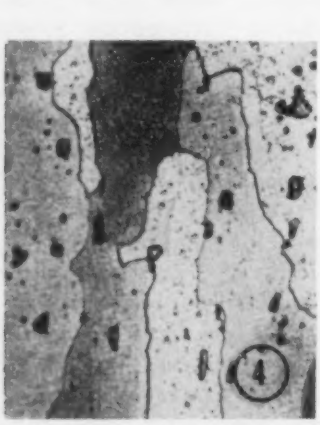


Fig. 4—Microstructure of normally heat treated 24ST alloy. Solid solution plus insoluble copper-iron-manganese constituents

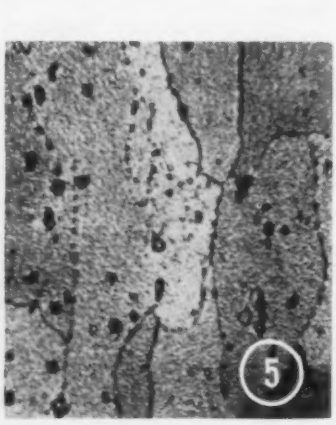
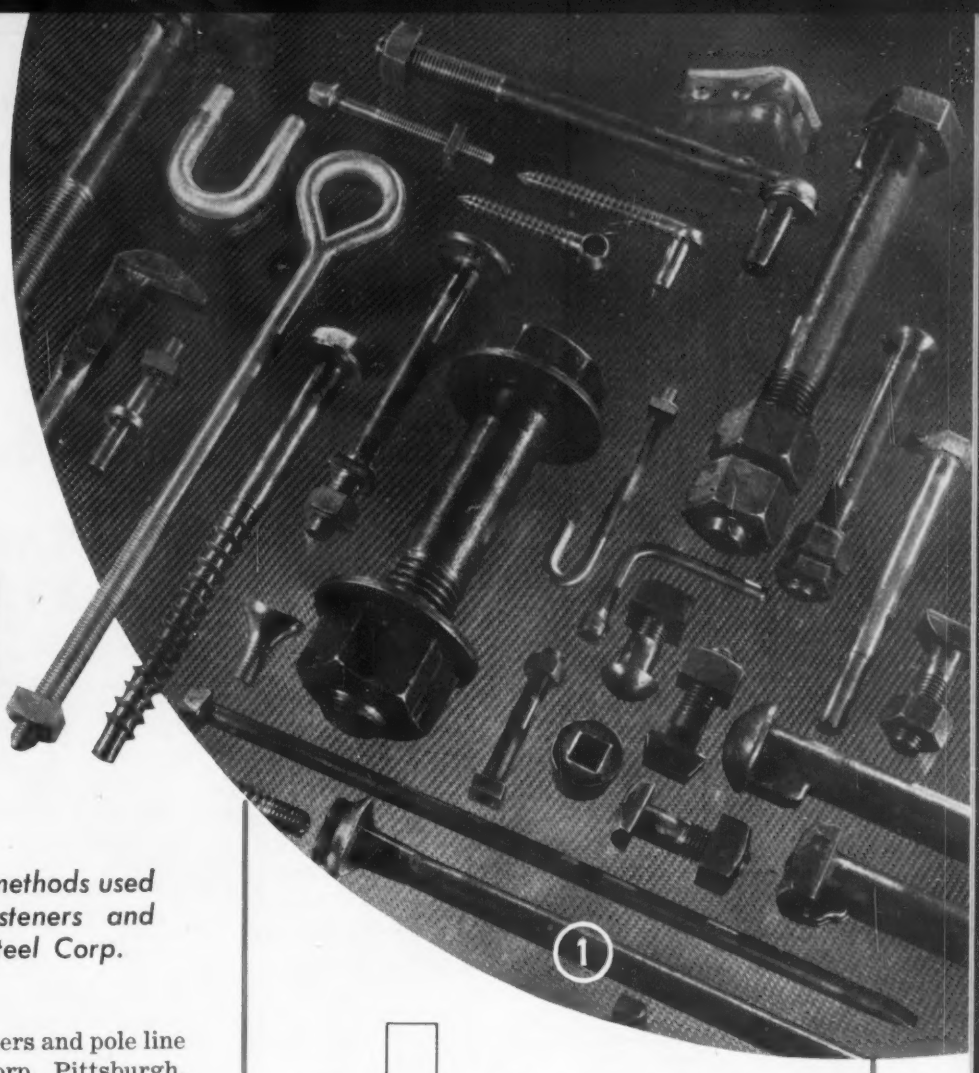


Fig. 5—Microstructure of heat treated 24S alloy cooled slowly in still air. Note preferential precipitation along grain boundaries which impairs intergranular corrosion resistance

Fig. 6—Microstructure of alclad 24ST alloy showing heat treated core, diffusion zone, and high purity aluminum surface layer

FABRICATING

Steel Hardware



Variety of hot and cold working methods used in manufacturing industrial fasteners and hardware at Oliver Iron & Steel Corp.

FABRICATION of steel into fasteners and pole line hardware at Oliver Iron & Steel Corp. Pittsburgh, can be divided into two major categories; namely, cold and hot working of metal. On an average, 20 per cent of the weight of products manufactured by the company are made by hot working steel into required shapes and forms. Approximately 30 per cent are manufactured cold, and the remaining 50 per cent produced by a combination of both processes.

Hot Working — There are four methods of hot working steel by forging; all four are utilized at Oliver. These are drop forging, machine or upset forging, press forging, and smith forging, each of which when used, is a means for obtaining a specific degree of improvement in the steel. This is brought about by the kneading or hammering action which refines the metal into a dense, tough, fiber structure throughout.

Drop forging, upset forging, and press forging employ closed impression dies for forming parts to specific shapes. Smith forgings, however, are formed with flat or open faced dies.

Drop Forging—Drop forgings are produced by intermittent impact pressure on the steel stock when heated to a plastic condition. The impressions required to produce a specific shape are sunk in a set of die blocks. These are then placed in a board or steam drop hammer with the top die in exact alignment with the bottom die. Top die is caused to impart an intermittent impact pressure on the bottom die by the force of the weight of the ram falling when the friction rolls are released from the boards and lifted only to fall again by the friction between the boards and rolls on the board drop hammer.

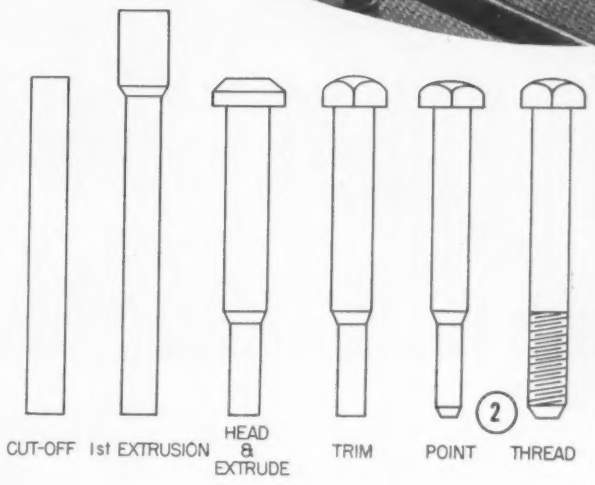
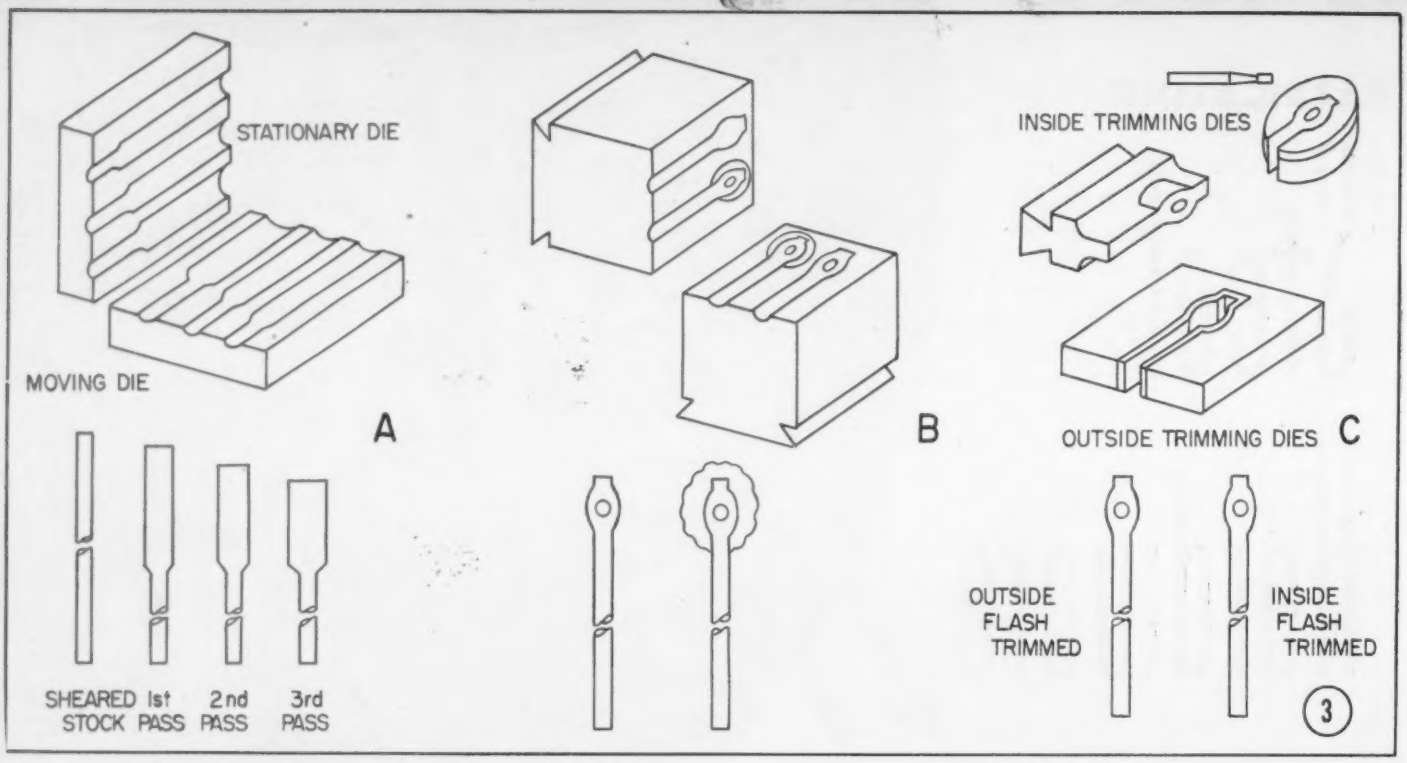


Fig. 1 — Typical products manufactured

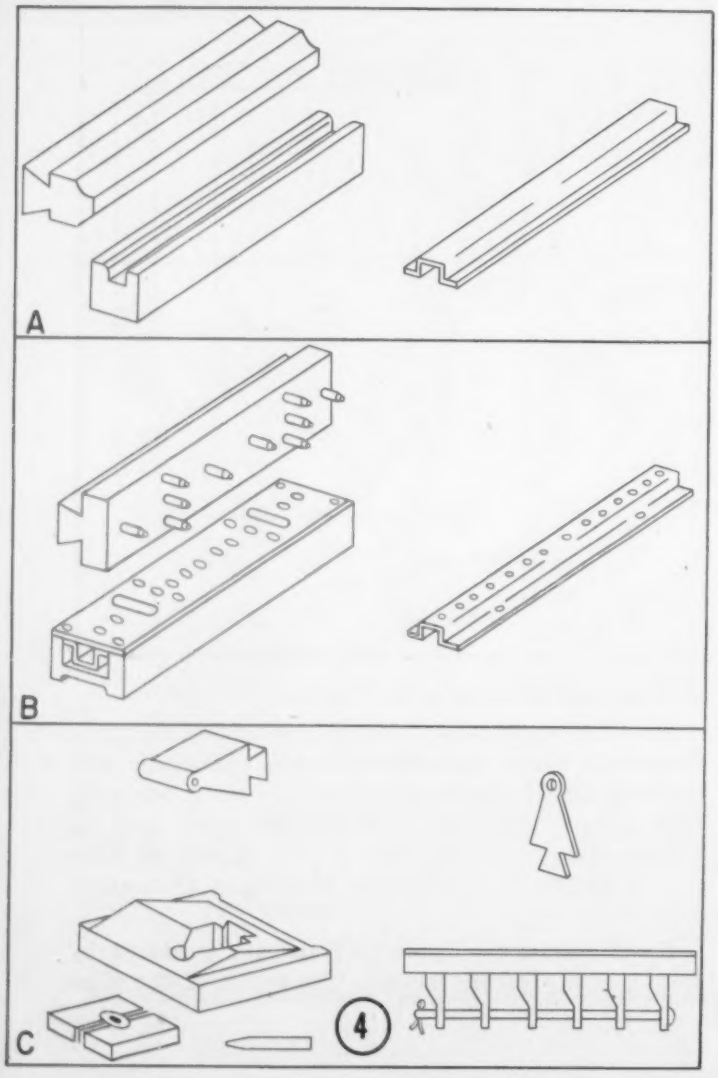
Fig. 2—Steps in manufacture of cross arm brace

Complex or difficult designs can now be drop forged by using successive forging operations and many shapes formerly considered difficult for drop forging are now being forged in our shop. It is no longer wise to assume that a part cannot be drop forged until the possibilities have been thoroughly surveyed.

Upset Forging — Upset forgings are produced by the squeeze pressure method. The action of the plas-



tic metal in the forging machine is similar to that in the drop hammer, in that it follows the path of least resistance when moved under pressure; but the movement is the result of the strong rapid push which increases in intensity after contact of the punch has been made and reaches a maximum at the end of the machine stroke.



Press Forging—This method is usually confined to the production of comparatively simple and symmetrical forgings. In press forging, the squeeze pressure builds up to a maximum at the end of the stroke as it does in the operation of the forging machine.

While the forging machine performs its work in a horizontal plane on a bar of stock, the forging press operates in a vertical plane on slugs of proper size heated to forging temperature, and the slug is placed on the bottom die and given a blow under the press, which forces the plastic metal into the various cavities of the dies. Press forging method includes the use of a mechanical press, in which the slow squeeze pressure action is substituted for the blow of a hammer of the board or steam type.

Smith Forging—Smith forgings are made on steam hammers or "open frame hammers". The open frame hammer uses a set of flat faced dies, so called because they have no impressions of a shape sunk into them, the faces of the dies being entirely plain. The forging process employed in the smith hammer is generally for the purpose of reducing the stock or cross section of the metal. This type of forging is generally employed where the cross sectional area of the stock is large enough to make the largest cross section of the finished forging, and the remainder of the metal stock is hammered down to the proper size for other sections which are included in the finished forging.

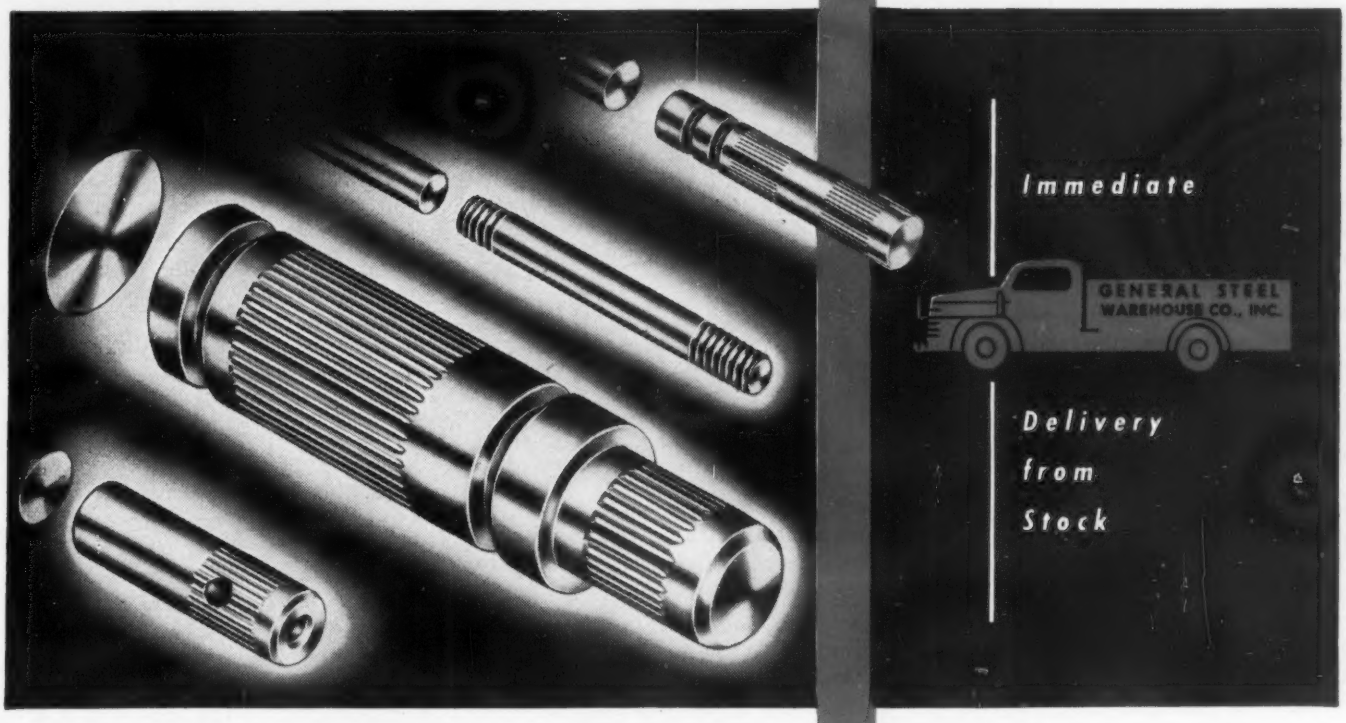
Hot Work Examples —(*Please turn to Page* 86)

Fig. 3—*Manufacture of a* ⅝*-inch thimbleye bolt is good illustration of combination of two methods of hot working steel. A—Upsetting dies and stages of upsetting; B—drop forging hammer dies and stages of drop forging; C—trimming dies and stages of trimming*

Fig. 4—*Steps in cold working the No.* 2338 *heavy type secondary rack. A—Shearing and pressing dies, and rack back after pressing; B—punching dies and rack back after punching; C—piercing and blanking dies; and (upper) point after piercing and blanking, (lower) heavy type secondary rack*

For Improved Screw Machine Products

DRAWN, GROUND & POLISHED
B-1113 TOLERANCE ± .0005



GENSCO again offers a complete stock of drawn, ground and polished bars. This large stock from leading mills is as close as your telephone, available for immediate delivery, packed to your specifications and ready for your finest screw machine and general machine work. Gensco Sales Engineers are always available to assist you with your metalworking problems and selection of proper steels.

A SPECIALIZED STEEL SERVICE

As an added service General Steel Warehouse Co., Inc. will shear, slit, and edge your steel to exact specifications. This complete service, on the most modern equipment has aided many manufacturers in speeding up their production.

COLD FINISHED BARS • SHAFTING • TEMPERED AND ANNEALED SPRING STEEL • DRILL ROD • SHIM STEEL • COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTHS • ROUND EDGED STRIP STEEL • FEELER GAUGE • ROUND WIRES • STEEL BALLS.

GENERAL STEEL WAREHOUSE CO., INC.

1830 N. Kostner Avenue, Chicago 39, Illinois • Belmont 4266

CINCINNATI • MILWAUKEE • ST. LOUIS • NEW YORK

Electric Furnace Operators

EVALUATE STEEL CLEANLINESS

Present trend in electric furnace shops is towards the use of lime-silica or slightly carbidic slag during refining period. Exact source of refractory inclusions is undetermined. Dornin process aims for high ingot yield. Some believe oxygen practice has passed experimental stage

INTEREST in electric furnace practice and particularly in that phase of the practice which has to do with clean steel was demonstrated at the fifth annual electric furnace steel conference sponsored by the Electric Furnace Steel Committee of the Iron and Steel Division, American Institute of Mining and Metallurgical Engineers, Hotel William Penn, Pittsburgh, Dec. 4-6. Registration topped 550.

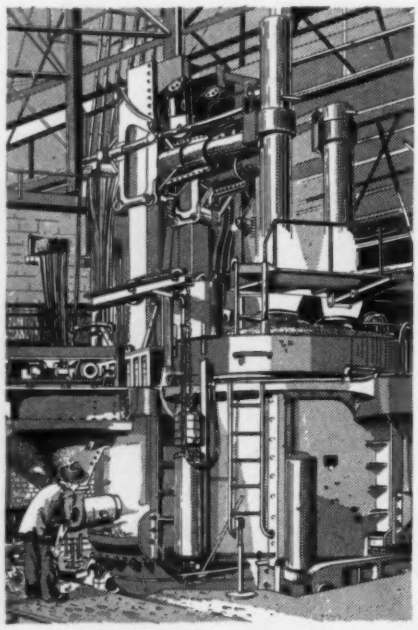
Philip Schane Jr., chief process metallurgist, Carnegie-Illinois Steel Corp., Pittsburgh, emphasized in making a heat of steel the melter should know what is in the charge. When melted the carbon will be in the desired range, the slag in the desired condition and the bath composition such that no delays will be encountered in eliminating unwanted elements.

The most positive way of getting a uniform carbon boil, he explained, is by the use of oxygen, although ore or cinder can be used. Vigorous action will equalize temperature and composition, eliminate gases and by bringing all portions of the metallic bath into contact with the slag to absorb or dissolve the suspended nonmetallics in the steel.

Some operators depend on deoxidation of the metallic bath by the slag alone, while others prefer to deoxidize the metal directly with materials such as aluminum or silicon. The advantage of deoxidizing by the slag is that any products of deoxidation are found at the slag-metal interface and enter the slag instead of being formed in the metal and possibly remaining there.

Some prefer carbides, some lime-silica, some alumina refining slag. What is desired is a fluid slag low in oxide content. The present trend appears to be toward the lime-silica or slightly carbidic slag.

Technique of shaping and refining slag is important because if too large additions of deoxidizer are made to the slag at one time, some of the deoxidizer may enter the steel and



react with any iron oxide present to form inclusions. Slag should be kept deoxidized by frequent small additions of deoxidizers.

All additions in the refining period should be clean and dry. Additions to the slag rather than the metal insure that nonmetallics in the alloy and those formed by reactions remain in the slag.

Exposure of the metal to air to as short a duration as possible is recommended in tapping. This means fast tapping in a solid stream and having a protective covering on the steel in the ladle. Slag serves this purpose and may also wash out some of the nonmetallics, especially those which may have formed on the surface of the tapping stream. It is a good practice to hold the steel in the ladle to allow any entrapped inclusions, slag or refractory to rise to the slag.

In pouring the steel into the mold, a clean full stream is desired. When necessary to stop pouring at the hot top junction, the scum which sometimes forms on the surface of the steel at this point may be carried into the steel when the hot top is poured and is a potential source of inclusions, Mr. Schane said in conclusion.

Discussion of his paper brought out the opinion that the lower the iron oxide in the steel and slag before tapping, the cleaner the steel will be. Formation of inclusions is not due to entrapment but to products of solidification. If a test sample of steel is taken before tapping it will be found clean; therefore, it was explained, inclusions found in the final product had their origin in the cycle of cooling to the solidification point. It also was stated that the size of the inclusion depends upon the rate of solidification. Some remain in solution because they have not had time to react.

Sidney W. Poole, supervisor of metallurgical research, Republic Steel Corp., Canton, O. in discussing deoxidation and deoxidation products in electric furnace steel mentioned that an active boil should be in progress during the meltdown or oxidizing period with the bath temperature continuously rising and reaching a maximum just prior to the slag-off period. This procedure supplemented by the use of a manganese or silicomanganese reboil, which functions as the first stage of deoxidation, is essential in the production of clean low-carbon alloy grades. Use of manganese in conjunction with silicon favors the production of a fluid easily coalesced manganese silicate type inclusion which can float up or be absorbed by the slag. When melting high-carbon steels, a manganese residual is essential as well as high temperature in the bath to promote inclusion elimination. Bath temperatures at the slag-off period should be above 2900 degrees F to promote fluidity of the metal with its consequent beneficial effect on inclusion elimination.

Carbon itself is a good deoxidizer especially with respect to the higher carbon analysis and has an added advantage over the metallic deoxidizers in that the reaction products

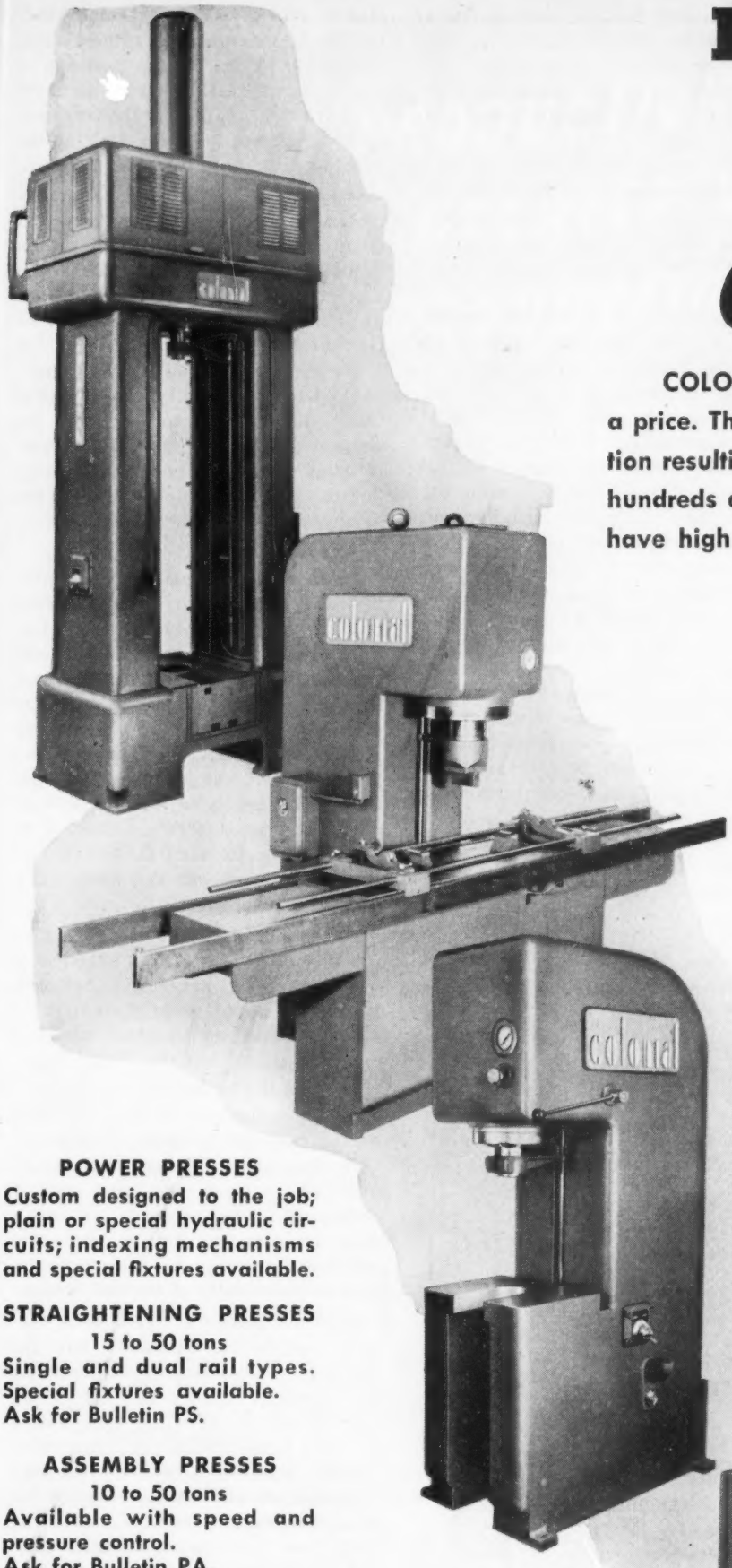
HYDRAULIC PRESSES

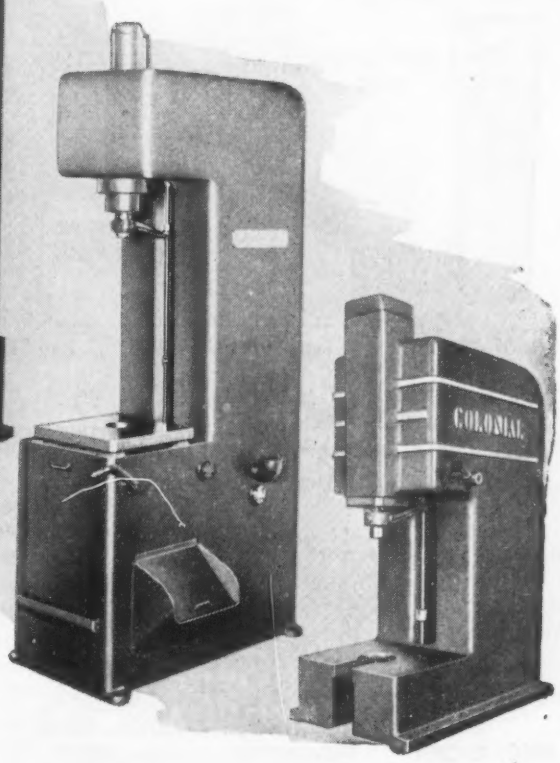
by

Colonial

COLONIAL hydraulic presses are not built to a price. Their low cost is due to quantity production resulting from their universal applicability to hundreds of different types of jobs. All machines have high overload reserve capacity.

For broaching
for assembling
for straightening
for forming
for punching
for plastics work
for aluminum and magnesium





colonial
BROACH COMPANY

Box 37, Harper Station Detroit 13, U. S. A.

POWER PRESSES
Custom designed to the job; plain or special hydraulic circuits; indexing mechanisms and special fixtures available.

STRAIGHTENING PRESSES
15 to 50 tons
Single and dual rail types.
Special fixtures available.
Ask for Bulletin PS.

ASSEMBLY PRESSES
10 to 50 tons
Available with speed and pressure control.
Ask for Bulletin PA.

"UTILITY" PRESSES
4 to 10 tons
Available with speed, pressure and dual safety controls; pulldown attachment.
Ask for Bulletin VBS.

"JUNIOR" PRESSES
1 to 4 tons
Available with pedestal and with straightening or pulldown attachment.
Ask for Bulletin VJ-1.

formed are gaseous. It would follow that a lesser amount of insoluble oxide and silicate type reaction products would form as a result of subsequent deoxidation reactions and that a shorter time would be necessary to establish carbon-oxygen equilibrium in the bath after slag-off.

The basic lime-silicate slag used in the refining or deoxidizing period should average over 60 per cent CaO and be low in FeO content (0.50 per cent or lower.) Coke can be added to this slag, depending on the analyses being made to promote a reducing condition. Urban and Derge state that variation in CaC_2 content of the slag has little effect on FeO content of the bath. Bath oxygen is fundamentally dependent upon the carbon-oxygen equilibrium and this equilibrium condition is generally attained under slags of this type within 80 minutes of the slag-off period.

When carbon-oxygen equilibrium is attained under a reducing slag subsequent deoxidation using silicon should be largely a matter of bringing the silicon content up to specification and not the formation of large amounts of additional silicate inclusions. This would be particularly true for a high-carbon steel where the amount of dissolved oxygen in equilibrium with carbon is small. For low and medium carbon steel early addition of a relatively strong deoxidizer as aluminum should aid in establishing a low dissolved oxygen content more rapidly under the reducing slag.

In reviewing the effects of refractories on steel cleanliness, Joseph G. Mravec, melt shop metallurgist, Timken Roller Bearing Co., Canton, O., presented the following information:

Identification of Refractory Inclusions: So far, the macroetching of slices cut from the extreme ends of blooms, billets or bars is still the most common and commercially feasible production test for refractory inclusions. When present in the macroetched steel samples such inclusions are easily detected because of the contrast between their nonmetallic gray-white appearance and the metallic gray background of the etched steel. Most refractory inclusions are about the size of a pin head and smaller.

Unfortunately, however, there exists no definite means of determining the exact source or sources of refractory inclusions. In no cases have we ever found any basic refractory inclusions such as might be retained from the magnesium oxide of the furnace banks and bottoms.

Distribution of Refractory Inclusions: We have found that refractory inclusions are encountered most frequently in the bottom portions of the ingot where freezing of the steel is the fastest and hence, the tendency for entrapment of inclusions is the greatest.

We have also found that refractory inclusions are more frequently encountered in low-carbon steels than in medium and high-carbon steels. Refractory inclusions are entrapped much more frequently in skulled or cold heats than in normal and hot heats are less erosive on the refractories but their fluidity is so low that what little refractories may be washed in, stand a much more poorer chance of rising out. Control over pouring temperature, therefore, is the greatest single factor affecting cleanliness.

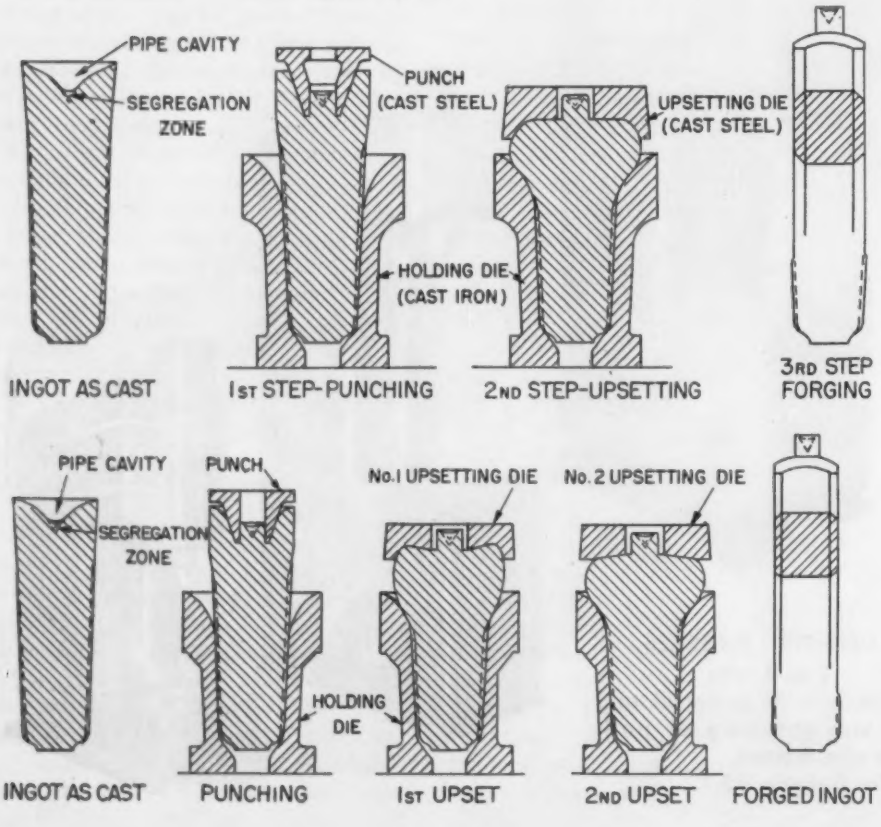
Cleanliness Evaluation: Our monthly etch test ratings on various grades of both basic open-hearth and electric furnace steels show that refractory inclusions are found only once in about every 200 blooms and bar etch tests examined. With infrequent occurrence of refractory material and knowing that the entrapped refractory inclusions have an almost random distribution within a heat, it is not possible to accurately evaluate steel cleanliness on the basis of a small number of tests.

Furnace Bottoms: Regardless of whether steel was melted on burned-in or rammed magnesite bottoms, we have never encountered basic (MgO) inclusions in steel samples.

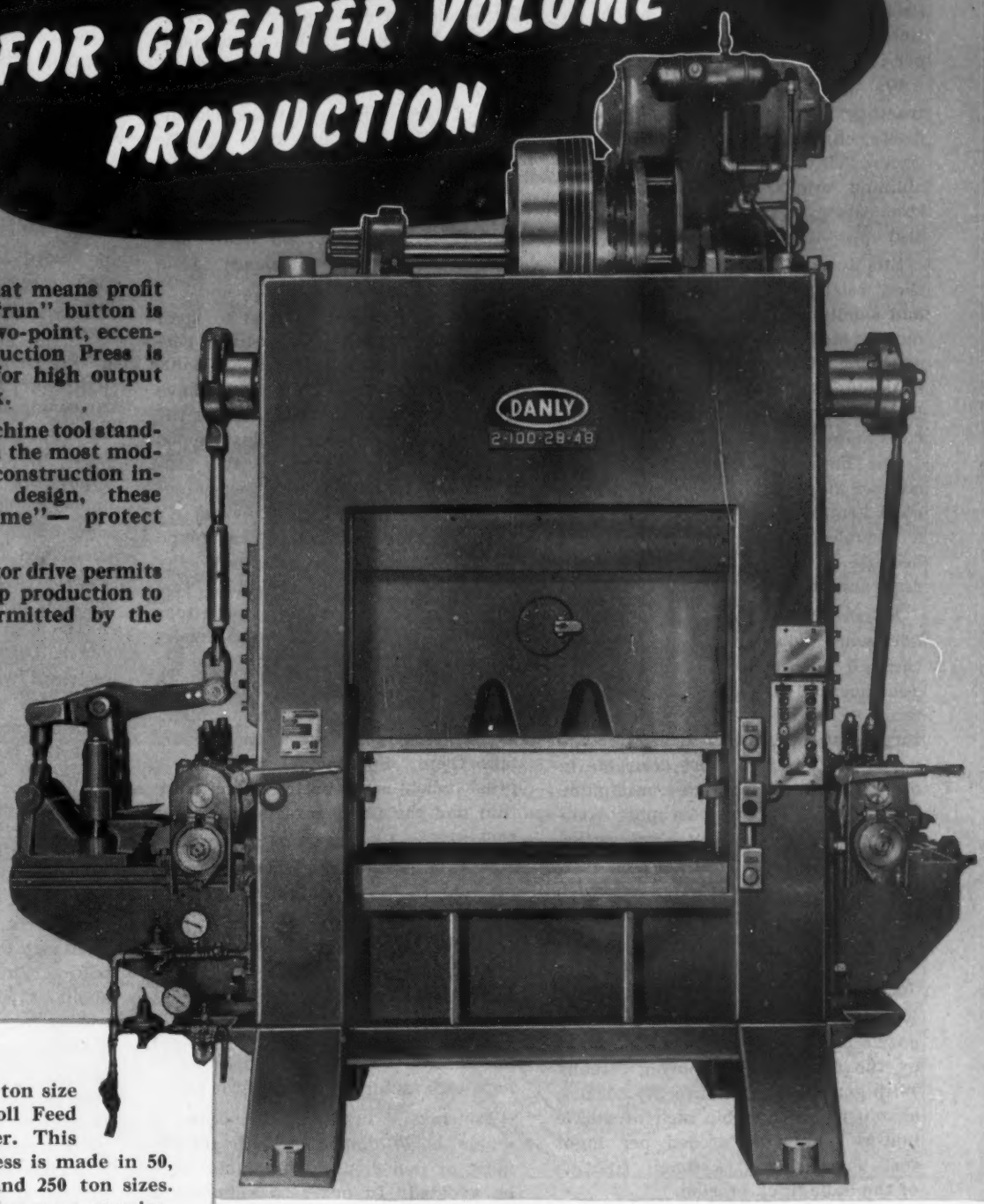
If, however, bottom or bank trouble during melting is so serious that it is necessary to work the heat on the cold side to favor the bottom, then fireclay inclusions from subsequent refractories are more readily entrapped. The presence of inclusions on such bad bottom heats are attributed directly to cold temperature and indirectly to the bad bottom.

Furnace Runners: This is a possible source of inclusions but the material eroded out by tapping has an excellent opportunity of rising out of the metal while the heat is in the ladle. Runners lined with regular ladle brick bonded with high temperature cement have given the most satisfactory service date. Recently we have service tested clay-graphite brick and have found that while they are more resistant to erosion, they failed at the joints and this limited the life of the runner to about that of the regular ladle brick. No effect on steel cleanliness was noticed through the use of clay-graphite brick, nor was there any car-

Top—Diagrammatic representation of Dornin process where only one upsetting operation is required. Bottom—Representation where upsetting is accomplished in two steps



HIGH PRODUCTION PRESSES FOR GREATER VOLUME PRODUCTION



HERE is a press that means profit every time the "run" button is pushed. This Danly two-point, eccentric gear, High Production Press is specifically designed for high output of strip up to ¼" thick.

Sturdily built to machine tool standards of precision, with the most modern features of press construction incorporated in their design, these presses cut "downtime"— protect costly dies.

A variable speed motor drive permits the operator to step up production to the highest speed permitted by the material being stamped.

Compare the features and construction of this line of presses against those of their type with which you are now familiar. Danly's Press Division will be glad to supply more complete information upon request.

Shown is the 100 ton size equipped with Roll Feed and Scrap Cutter. This type of Danly Press is made in 50, 75, 100, 150, 200 and 250 ton sizes. Send inquiries for your requirements to Danly.

Check and Compare These Features

- Two slide connections for accurate alignment.
- Fully enclosed construction (all weldments thoroughly stress relieved before machining).
- Circulating filtered oil pressure lubrication system. Pressure pump so arranged that press is inoperable until oil pressure builds to operating pressure.
- Variable speed motor drive (50-100 strokes per minute).
- Danly Improved Air-Friction Clutch.
- Flywheel shaft mounted on anti-friction bearings retained in removable pillow blocks provides easy accessibility for maintenance.
- Eccentric Gears, connections and gibs—bronze lined.

DANLY

MACHINE SPECIALTIES, INC.

2100 S. 52nd Avenue, Chicago 50, Ill.

THE PRESS FOR MODERN PRODUCTION

bon pickup on heats of 0.20 to 1.00 per cent carbon.

Ladle Lining: The ladle lining with its large surface area in contact with the molten steel is considered to be one of the most potential sources of refractory inclusions. On some fireclay brick linings as much as 100 cubic inches of brick are eroded per ton of steel.

We have not found any high refractory type bricks such as magnesite, chrome, forsterite, sillimanite, zircon, clay-graphite, mullite, high alumina bricks, to produce cleaner steel than do the conventional general purpose fireclay brick.

Stopper Rod Assembly: Because of their relatively higher refractoriness and smaller surface area exposure to molten steel, the stopper rod sleeves are not believed to be so great a source of inclusions as ladle bricks. Use of higher refractory bottom sleeves may have some merit.

The high refractory clay-graphite stopper head commonly used by all steel companies is not considered as a troublesome source of inclusions because of its small size and high resistance to erosion.

Nozzle Well: During pouring the downward motion of the steel passing through the well carries into the ingot mold whatever nozzle well material it erodes away. A high refractory material for setting in the nozzle is therefore most desirable in order to keep erosion to a minimum. Good quality fireclay is most commonly used to construct nozzle wells.

On certain special grades of steel the nozzle well is formed with rammed magnesite material because it is more refractory than plain fireclay and hence will erode less during pouring.

Nozzles: Material eroded from the nozzle is all washed into the ingot by the force of the pouring stream. With general purpose fireclay nozzles, as much as 0.5 cubic inch of nozzle material may be eroded per ingot ton. This is only a small fraction of the ladle brick erosion.

Our experience with the special high refractory nozzles has been disappointing in that they do not pour with as clean a stream as do the lower refractory general purpose nozzles. On hot or fluid heats, the high refractory nozzles perform satisfactorily from the standpoint of erosion. Cold or skulled heats tend to be especially dirty regardless of the fact that on the average they are considerably less erosive on pouring pit refractories. We conclude therefore that control of steel temperature is equally or more important towards production of clean steel than control over refractory erosion.

Experience with tarred general purpose nozzles has indicated that they have a lesser tendency to cut out than the untarred nozzles and yet produce a clean pouring stream. We use a tarred nozzle on the more erosive grades of steels and on all gears, pinions and other steels to be free of refractory materials. On all other grades the same type of general purpose nozzle is used except in an untarred condition. Tarred nozzles are prepared by boiling them in tar at 225 degrees F for 48 hours and then oven drying them; excess tar is brushed off.

Hot Tops: Clay tops tend to spall much more than do brick-lined permanent tops. Studies of longitudinally split and macroetched ingots have shown refractory inclusions under the hot top junctions of the clay topped ingots. We pour a considerable tonnage into both clay and permanent topped molds; yet on the last 12 heats on which refractory was found in top bloom etches, 11 were clay top heats and one permanent top. We try to avoid the use of clay tops on all heats which must be especially free from refractory inclusions.

Mold Plugs: Clay mold plugs are a potential source of fireclay inclusions. They spall when the stream hits them. Spalling is particularly great when mold bottoms are worn thin and the plugs protrude into the cast ingot.

Metal capped plugs were not found to be much better than all-clay plugs since on older molds with thin bottoms a considerable amount of clay sides was exposed to the steel as a result of the protruding condition of the plugs. In recent years, iron plugs have been difficult to obtain but carbon plugs have been found to be a satisfactory substitute for them.

Pouring Pit Practice: Cleanliness of molds is of importance if entrapment of inclusions in the ingot is to be avoided. In order to maintain a clean-as-possible pouring pit, we have cemented the entire floor of our pit. Unless clean preparation of runners, ladles, nozzle wells, stopper rods and molds is exercised by the personnel, the beneficial effect of using even the best pouring pit refractories will be nullified.

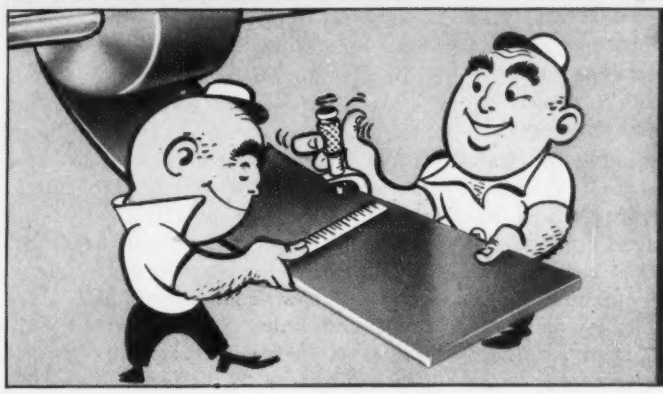
George A. Dornin Jr., Dornin Molds, Youngstown, O., in explaining the various steps involved in the Dornin process stated that standard killed-steel melting practice is used unchanged. Steel is poured into a big-end-up mold with a taper about two to three times that normally used on hot-top ingots and immediately covered with insulation. Cork gives the best combination of good early and late insulating properties. It is applied immediately after pouring, about 2 inches deep at the outside and 4 inches deep in the middle. It gives a good exothermic effect from the start and both cork and its ash are effective insulators. The ingot solidifies completely in the mold and is then stripped and sent to the pits or furnaces, where it is heated and soaked exactly as it would be for rolling or forging. Ingot weight may be varied 10 to 15 per cent in one mold size simply by changing pouring heights to suit cutout requirements.

Processing is done under a press or presses, in the steps shown at top in accompanying diagram: The drawing on the left shows the solidified ingot with the pipe cavity at the upper end and the segregate zone under it. The heated ingot is first placed in a cast-iron holding die and positioned under a press. A hollow, tapered punch is then driven into the top of the ingot to the bottom of the segregate, the bottom of the punch being protected by a heat-resistant weld deposit such as Stellite. The next step is to drive the steel surrounding the segregate down past the bottom of the segregate as shown in the third drawing. The segregate is now isolated and if the punched-out core were cropped at this point, all the steel remaining in the ingot would be sound and usable save for a layer, amounting to 1 to 2 per cent, that represents the original top surface of the ingot as poured. The punched-out core weighs about 1 per cent of the ingot's weight.

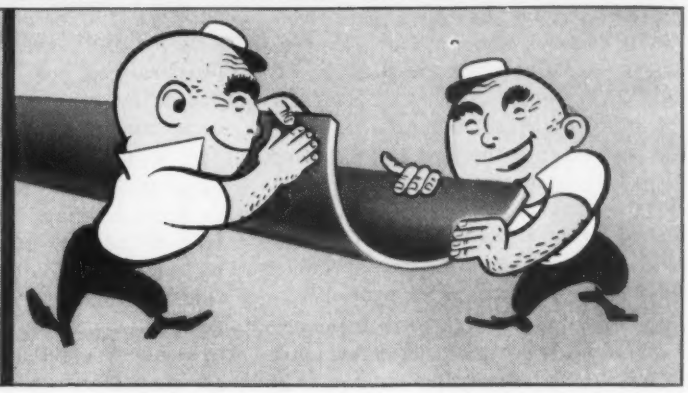
Obviously, however, the upset ingot is not now in a rollable condition, so the last step is to remove it from the holding die and forge it to a size suitable for the blooming mill, the lower end being held by a manipulator during this operation. Rather wide forging dies are used and these produce considerable bulge of the upper end of the ingot during forging, thus overcoming the mill's tendency to "fishtail" the end during subsequent rolling.

The ingot is given a flash reheat between forging and rolling and the top crop is normally taken after rolling. Allowing for a total scale loss of 3 to 4 per cent, a bottom crop of 2 to 3 per cent and a top crop of 4 to 5 per cent, a blooming-mill yield of about 90 per cent can be obtained.

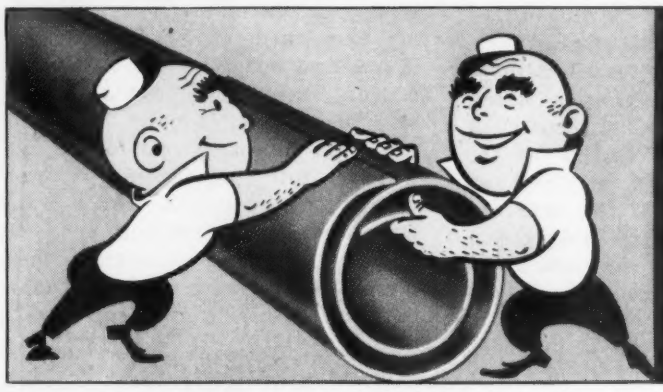
INSIDE STORY OF BUNDYWELD



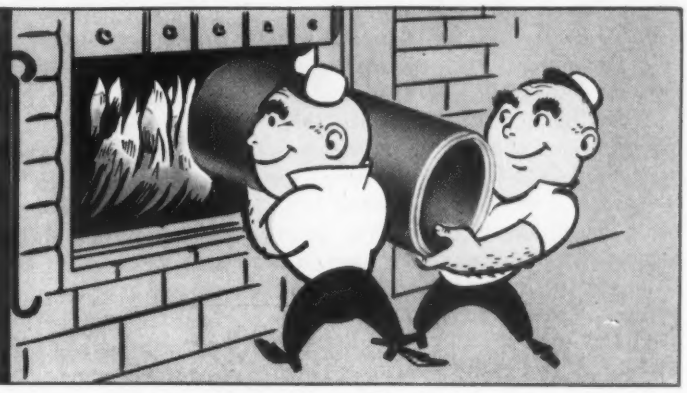
1 Bundyweld Steel Tubing is made by a process entirely different from that used in the making of any other tubing. A single strip . . .



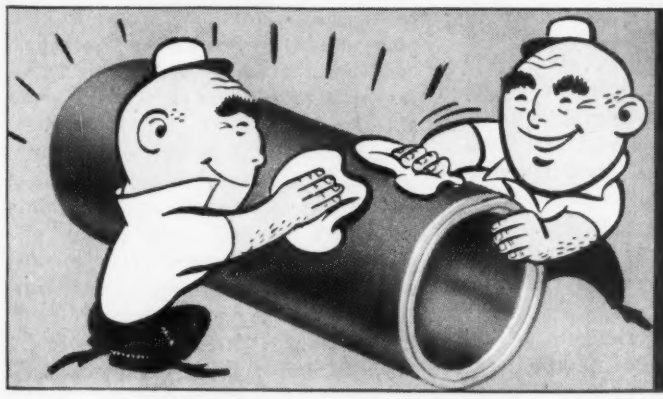
2 . . . of copper-coated S.A.E. 1010 steel is *continuously* rolled twice around *laterally* into tubular form. Walls of uniform thickness and concentricity . . .



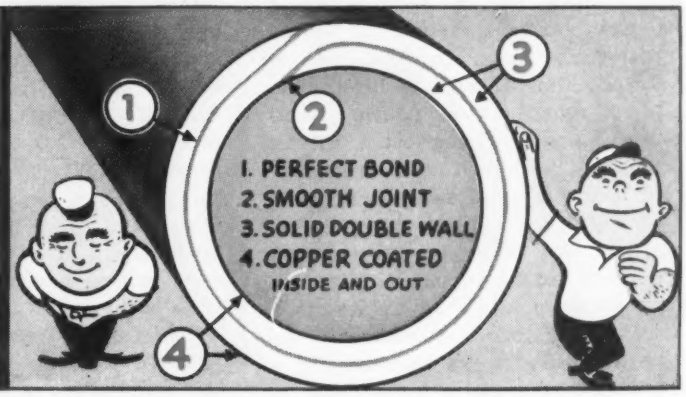
3 . . . are assured by the use of close tolerance cold rolled strip. This double rolled strip in tubular form is next passed through . . .



4 . . . a brazing furnace, where the copper coating fuses and alloys with the double steel walls. After brazing and cooling, the tubing has become . . .



5 . . . A SOLID double wall steel tube completely copper brazed throughout 360° of wall contact, copper coated inside and out, free from scale and closely held to dimensions.



6 Bundyweld is furnished hard or annealed in a wide range of standard diameters and gauges up to 5/8" O.D. Special sizes, cold drawn as desired. Also furnished in Monel and nickel.

For further information write Bundy Tubing Co., Detroit 14, Mich.

BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES:

Standard Tube Sales Corp. 76-01 Woodhaven Blvd. Brooklyn 27, N.Y.	Peirson-Deakins Co. 823-824 Chattanooga Bank Bldg. Chattanooga 2, Tenn.	Lapham-Hickey Co. 3333 W. 47th Place Chicago 32, Illinois	Rutan & Co. 404 Architects Bldg. Phila. 3, Pa.	Pacific Metals Co., Ltd. 3100 19th St. San Francisco 10, Calif.	Eagle Metals Co. 3628 E. Marginal Way Seattle 4, Wash.	Alloy Metal Sales, Ltd. 861 Bay St. Toronto 5, Canada

In the work to date, we have achieved yields as high as 91 per cent and have averaged 88 per cent. Since blooming-mill yields on hot-top ingots are usually between 75 and 80 per cent, the increase will be at least 10 per cent and in most plants will average about 12 per cent. Bottom of accompanying diagram shows a slightly different method of performing the operation, the upsetting being divided into the two steps shown; this makes it possible to process a larger ingot on a given press. This is the method used on practically all the ingots processed to date, because of the size of the press available.

Since economic factors influence everything done in a steel plant, most of you will probably be interested in the time involved in processing. Using a standard 1000-ton steam-hydraulic press for the entire job, with experimental tool-handling equipment, we have processed more than sixteen 5000-pound ingots per hour. Punching and upsetting averaged 50 seconds, including tool movements, forging averaged 2 minutes 11 seconds, or a total of 3 minutes 1 second for the useful time. The remaining time, 41 seconds, was consumed in pushing the anvil in and out, manually removing scale from the anvil plate, and in the delay between ingots. The crew was working at a straight hourly rate.

Given the proper ingot design, the pouring of such an ingot is a simple operation. In general, what is good pouring practice for hot-top ingots is good pouring practice for ingots without hot tops; for instance, in both cases molds must be level when poured. Nozzle size, pouring temperature, and pouring rates are all important, although standard practice nearly always works out satisfactorily for this type of ingot. The pouring rate must be fast enough to ensure fluidity in the top surface throughout pouring, which means a minimum nozzle of about one twentieth the ingot's diameter (or a 1⅛-inch nozzle for a 5000-pound ingot).

On the other hand, an extremely large nozzle is neither necessary nor desirable, since its use leads to an unduly large pipe volume (because less of the ingot will solidify during pouring). We prefer a maximum nozzle size of about one sixteenth the top diameter of the ingot (about 1⅝-inch for a 5000-pound ingot) although we have used 1½ and 1¾-inch nozzles successfully.

Since there is only one shutoff to make per ingot, it is possible to reduce considerably the overall pouring time per heat. Part of this time is used to slow-pour the bottom of each ingot 30 seconds or so, thus providing a pool 12 to 18 inches deep to cushion the severe erosive action of the full stream, and thereby reduce stickers and increase mold life. This slow-pouring has proved entirely practical; on cold heats we have reduced the time of the slow-pour or, occasionally, eliminated it altogether.

C. E. Sims, assistant director, Battelle Memorial Institute, Columbus, O., in discussing "Hydrogen and Nitrogen Contents of Steel As Effected by Melting Practice," pointed out that hydrogen to an amount of 0.30 relative volume or more is commonly present in steels of casting grades at the ladle. A sufficient proportion of this hydrogen remains in the test bars and castings to cause important reductions of their ductility.

This quantity of hydrogen, he stated, can be reduced during steelmaking, with proportional benefit to ductility by maintaining a strong boil, normally one of sufficient activity to reduce carbon at the rate of 0.40 to 1.00 per cent an hour. In this effort, the acid arc furnace seems most amenable to control while the basic open hearth offers the greatest resistance to effective modification of practice.

To preserve the effect of hydrogen reduction during steelmaking, it is necessary to strictly limit the time spent in an inactive condition after boiling and to insure that the ladle refractories are thoroughly dry. Drying or preheating of the furnace and ladle additions may give some additional benefit in certain cases.

E. C. Barringer, executive secretary, Institute of Scrap Iron and Steel, Washington, said that this year the combined consumption of purchased or open market scrap will be between 23 and 24 million gross tons—within 5 per cent of the wartime high.

The army is undertaking to unload 500,000 tons of shells in the next six months. Army-generated scrap which should be returned to the United States by summer is believed to total 500,000 tons, a large proportion of which is of alloy grade.

Steel mills and foundries have about 2,700,000 tons of scrap in their inventories, but dealers' yards are down to 200,000 tons.

The average charge into electric furnaces is 56.4 per cent of purchased scrap, 40.7 per cent home scrap and 2.9 per cent pig. The electric furnace industry accounts for 8 per cent of the market for purchased scrap.

At the session dealing with the manufacture of oxygen and its use one producer mentioned that 99.5 per cent pure oxygen costs between $8 and $8.50 per ton based on a power cost of 7½ mills, water at 1 to 2 cents per 1000 gallons and a reasonable storage for 100 tons.

A combination of iron ore and oxygen for carbon removal is being tried at one shop. One manufacturer stated oxygen is now used in 19 shops, six of which have made it a standard practice. Use of oxygen, according to one operator, has passed the experimental stage and is now considered justifiable; roof and lining life of electric furnaces is increased and there is evidence of lower power costs.

Oxygen as an oxidizing agent is more favorable than iron ore in that there is no rise in the hydrogen content. One operator emphasized it is not how much oxygen that is put into a heat but how it is used when added. There is a desired oxygen rate of injection in any bath and this must be determined for the individual furnace. Oxygen is best used in stainless and low-carbon heats but there is some question concerning its value in connection with normal alloy steels and some low-carbon open-hearth rimming grades.

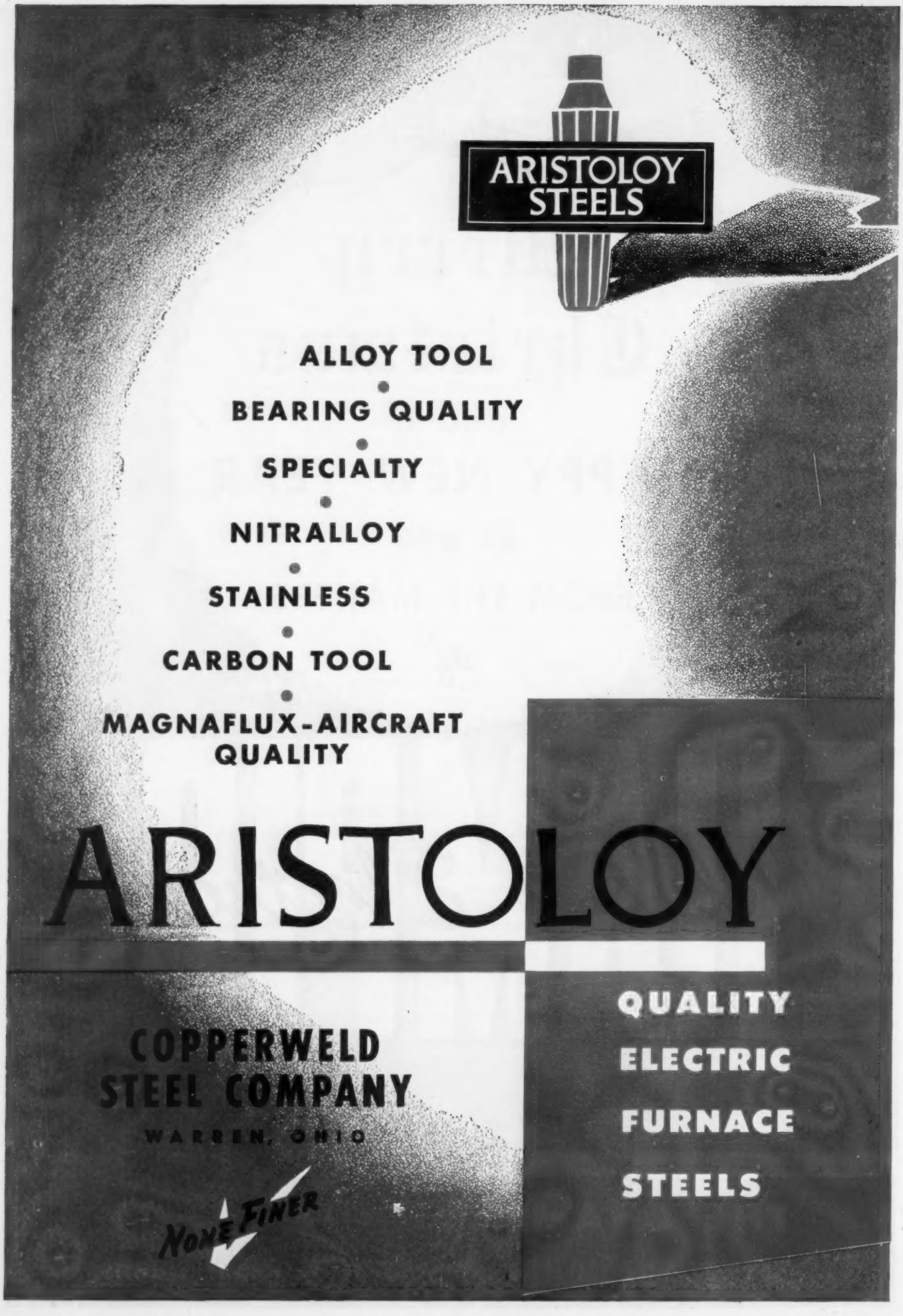
Aluminum Refining Data Contained in Report

With particular emphasis on processes still in the laboratory or pilot plant stage of development, a report containing data on aluminum refining in Germany has been made available by Office of Technical Services, Department of Commerce, Washington 25, D. C. Research on the subject has been directed toward refining secondary metal from scrap airplanes and refining electrothermically produced alloys of aluminum and silicon, the report states. It bears the number PB-78264.

Aluminum refining methods used or proposed in Germany are divided into four classes by the report. The first class involves the dissolution of aluminum in or treatment with another metal, followed by liquation or filtration and removal of the purifying metal by distillation or other means. Second class processes include chlorine treatment or melting with various salt mixtures. Third class includes processes in which attempts have been made to purify aluminum by use of chemistry of a monovalent state at high temperatures. The fourth class includes three layer electrolytic refining.

THE CHAMPION RIVET CO.

CLEVELAND, OHIO ★ East Chicago, Indiana


ARISTOLOY STEELS
ALLOY TOOL
BEARING QUALITY
SPECIALTY
NITRALLOY
STAINLESS
CARBON TOOL
MAGNAFLUX-AIRCRAFT QUALITY
ARISTOLOY
COPPERWELD STEEL COMPANY
WARREN, OHIO
NONE FINER
QUALITY ELECTRIC FURNACE STEELS

joined beyond that area welded at fusion temperatures.

Nickel will bond to steel at a relatively low temperature and it has been shown that, along the edges of the fused area of the resistance weld, a region of nickel is fully bonded to the steel and alloy. This region of "solid-phase" bonding has a tensile strength of 10,000 to 15,000 pounds per square inch. It improves the heat transfer properties of the cladding and the general overall efficiency of the liner.

Applications—Croloy bonded plates may be formed and handled without many special precautions. Cold working operations such as rolling into shells are performed in the same manner as for steel plates. Hot forming will depend upon the type of cladding and backing material. Such precautions as would be used for the liner material are used for the composite plate.

Flame cutting may be accomplished almost as readily as for steel except that larger tips are usually employed. Welding follows usual practice for clad plates. Either a solid alloy weld or a filler strip may be used to close the alloy over the steel weld. The cladding is usually extended to the edge of the weld grove and planed or chipped back to avoid contamination of the steel weld. The cladding thickness is uniform so that cutting it back the desired amount presents no special problems. Etching of the cut-back edge is wise to be certain that all of the alloy material has been removed.

Fig. 1 is a view of fabricated plate sections of a large diameter tower which are being shipped to the field for erection. Fig. 2 shows this tower in the field following erection. It has a 20 foot inside diameter and has an overall height of 100 feet. Its total weight is 150 tons. It is fully lined with 12.5 to 13.5 per cent chromium liner, 5/64-inch thick. The steel backing plate is A-70 steel, ¾-inch thick.

Transformer and Machine Design—Welding of the clad plates described has resulted in the design of what is believed to be an unusual welder of a type heretofore not used for seam welding applications. In designing this machine, Fig. 6, our previous experience indicated we would need considerable power and voltage for short periods of time. The usual resistance welder makes use of a stationary transformer from which large secondary busses lead and which carry 40,000 to 50,000 amperes or more depending upon the kilovolt-ampere rating of the machine.

Even with extreme care in design, these machines usually have large secondary reactance losses with corresponding low power factors. In applications such as the manufacture of clad plate, large current carrying bearings are needed to get adequate support and current capacity to the welding rolls. An integral type transformer of the type shown, places the rolls directly within the secondary current carrying members of the transformer and therefore, gets to the work its full output with a minimum loss. It becomes possible to reduce the overall kilovolt-ampere demand by approximately one-half and the efficiency and latitude of application becomes measurably greater.

Fig. 7 shows a general schematic diagram of the machine. This design makes use of two rotary-type transformers in which the primaries are connected in parallel by means of slip rings and of secondaries which consist of a single turn about the primary, series connected as shown. The secondary then makes up each transformer case and has a current path such as is indicated by the arrows. The primary core is circular wound and is designed for operation at 80,000 lines per square inch.

Space limitations made necessary a section proportion of the core of approximately 6 to 1. The high voltage winding is supported around the core. It consists of pancake coils of four turns each of square copper tubing. Each coil is series connected so that the primary consists of one-hundred and forty-four turns.

Water Cooled—Water cooling is used for the primary, and enters and leaves the transformer in the manner indicated by the diagram. It is to be noted that the primary cooling water discharges through the center of the transformer making possible cooling of the inner secondary-hub. The case, or outside secondary, is cooled by water discharged over the outside.

The two transformers are mounted by means of a main bearing and individual vertical slides. Pressure to the welding rolls is transmitted through this mounting by means of the pressure cylinders shown. Centers of the welding rolls may be adjusted by means of screws and cross slides. A variable speed drive moves the entire carriage along the cross beam at a fixed rate during welding.

Advantages derived from such a transformer design for resistance welding applications are many. The reactance characteristics are extremely low because of the resulting close coupling of the power source to the work. This gives a more consistent welding voltage. It allows for considerable power savings since an equivalent secondary current can be obtained from a design of half the normal kilovolt-ampere capacity. It allows for higher current flow into the work for shorter periods and helps, therefore, in overcoming shunt current troubles and contact resistance problems.

Variable Pressure—In order to obtain optimum welding conditions and minimum contact resistance, a variable pressure and current application is used for each spot weld. This system makes use of a pulsating current to the weld which is obtained by means of a pulsation timer. During the initial pulse the pressure is reduced to a minimum value at which surface contact resistance will not affect the surface of the alloy. After a short period of current flow and a one to two-cycle cooling time, a second pulse of current at higher pressure is applied.

During the second pulse the current density to the weld is also increased. This second current pulse and accompanying pressure increase gives greater depth of penetration, increases the area of the weld, and allows higher currents for shorter periods, an important factor with some alloys.

Experience with a complicated seam welding set-up, such as the one described, has shown that where the welding rolls travel over a comparatively long distance (10 feet) stresses build up in the equipment and cause a variable pressure condition between the start and finish of a welded seam. To overcome this condition a reverse pressure is applied between each weld. This re-establishes original conditions and gives more consistent weld for the full length of the seam.

Metallurgical Considerations—Composition of the alloy liner to be used in clad vessel construction is dependent upon the requirements of the corrosive conditions involved in the service intended. Choice of alloys available may be grouped as (1) the simple straight chromium transformable type (type 410), (2) the ferritic chromium-irons which are non-hardenable and essentially of ferritic

microstructure (types 405 and 430), (3) the austenitic-nickel-chromium stainless steels (types 316, 304, etc.) and (4) the nonferrous materials (nickel, Monel and Inconel).

For many oil industry applications, a high chromium-iron of 11.50 to 13.50 per cent chromium gives very satisfactory service. This steel is available as two types having slightly different properties. One (type 410) is a transformable alloy which, when cooled rapidly from above its critical range, may form a hard martensitic structure and is therefore frequently referred to as a martensitic steel.

This property may be objectionable for some applications because of the difficulties encountered in welding. Consideration of the so-called "gamma loop" indicates that, by a careful selection of this material, an excessive "as welded" hardness may be avoided. For, if the carbon and the chromium are properly balanced, excessive hardening with normal working of the alloy is not likely to occur. For example a type 410 alloy having an analysis of 13 per cent Cr—0.05 to 0.08 per cent C; or 14 per cent Cr—0.08 to 0.09 per cent C would be less hardenable than 13 per cent Cr and 0.15 per cent C etc.

Presence of elements other than chromium and carbon will also affect the hardenability of any particular iron-chromium-carbon alloy steel. Additions of the alloying elements which tend to stabilize the austenitic condition, or enlarge the gamma loop, will tend to increase the hardenability of a steel which otherwise would not excessively harden. For example, a 2 per cent nickel addition to the balanced compositions of the preceding paragraph would result in greater hardening tendency.

Experience indicates that type 410 alloy can best be resistance welded by the process described in this article when the analysis of the clad material is held within the limits suggested above and which when quenched from 1800° F will show a maximum hardness of approximately 275 brinell. Full annealing after the cladding operation is completed and prior to the vessel fabrication, is usually undertaken although with low carbons, adequate softening can be accomplished at stress-relieving temperature.

This may be illustrated by the successful application of type 410 arc welds deposits in clad plates. By using a core wire of 0.03 to 0.04 per cent carbon, and holding the chromium in the deposit of 11.5 to 12 per cent, an "as welded" hardness of 250 brinell was obtained. A stress-relieving treatment of 1150° F reduced the hardness to 160 brinell.

A second commonly used chromium-iron is type 405. This alloy has a composition similar to type 410 alloys except that up to 0.30 per cent aluminum has been added to the analysis. This addition tends to reduce the hardenability by producing a two phase alpha and gamma structure.

Type 405 alloy is successfully used for lined vessels but, due to its tendency to form a coarse-grained structure when heated to temperatures over 1800° F and the resulting cleavage brittleness, reheating and reworking of the affected areas prior to stress-relieving is best avoided. For example, failure along the heat-affected zones of arc-welded seams and supports has been reported by some users. Upon rewelding, it has been found difficult to obtain a tight joint, free of cracks along the line of fusion. These failures may be due to stresses from welding which cause successive failures in the brittle regions of the heat-affected zones of the welds.

Use of light weld beads and the avoidance of large welded areas will tend to help this condition. Overlapping resistance welds of the type described will give similar trouble under certain conditions, particularly where stress conditions resulting from the welding are severe, where the aluminum and chromium content of the alloy are on the high side and where the carbon is low.

Carbon Migration and Grain Growth — When a composite plate having a chromium alloy liner is heated at elevated temperatures for some period of time, decarburization of the carbon steel immediately under the alloy cladding occurs. The decarburized layer of steel is subject to grain growth of the ferrite grains, the extent of which is dependent upon the temperature to which it is heated and the length of time at that temperature.

Practical importance of carbon migration will depend largely upon the temperature history of the composite plate. If relative high temperatures are encountered for short periods, as in welding, it is not believed that the resulting decarburization has any practical significance. As operating temperatures become higher, and after long periods, same significance may be given this phenomenon.

Prevention of carbon migration may be accomplished by interposing between the alloy and steel backing material relatively thin layer of a material without affinity for carbon. This is successfully accomplished in the process described by the use of nickel sheets having a thickness of 0.007-inch.

Other Alloys—There are numerous other materials which are often requested for use as liners for vessels but which, because of their unusual properties, do not lend themselves adequately to bonding by resistance welding methods.

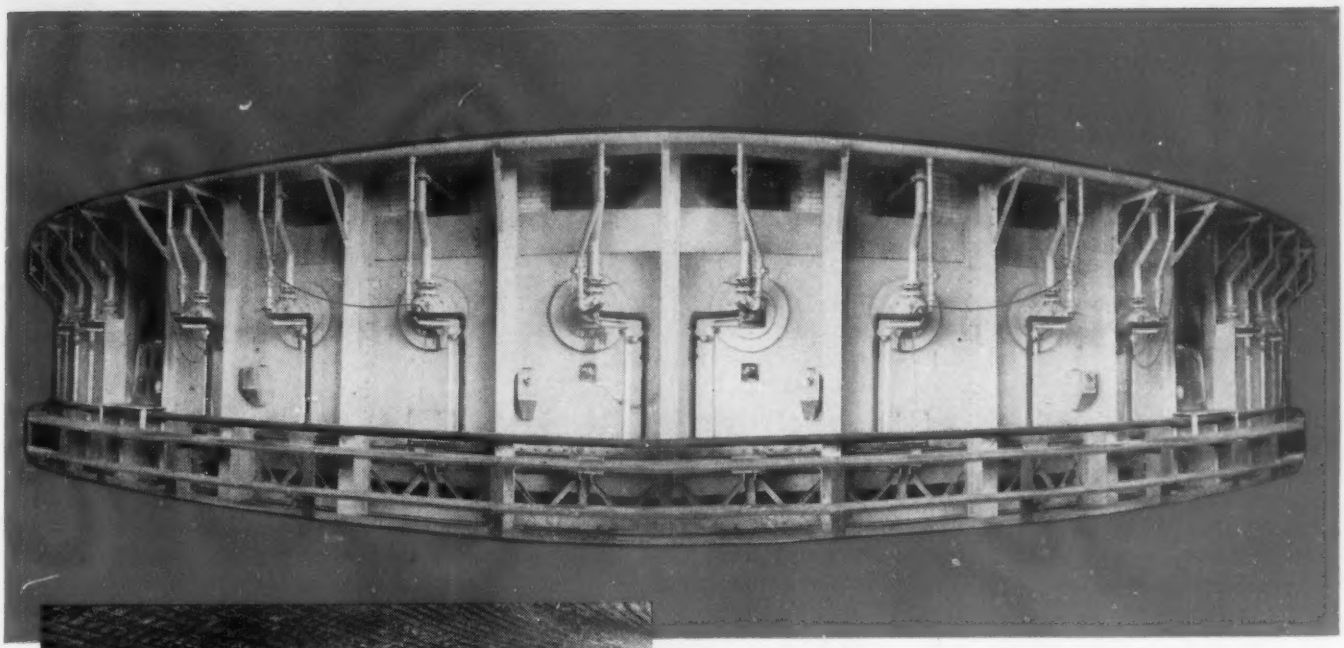
We recently developed a new method for producing composite clad slabs for subsequent rolling into plates which may be of interest. This method is believed applicable to most all alloys and nonferrous materials. It gives a fully fused bond of the clad material but does not have the objection of other similar fusion processes, which is an unevenness of the clad layer.

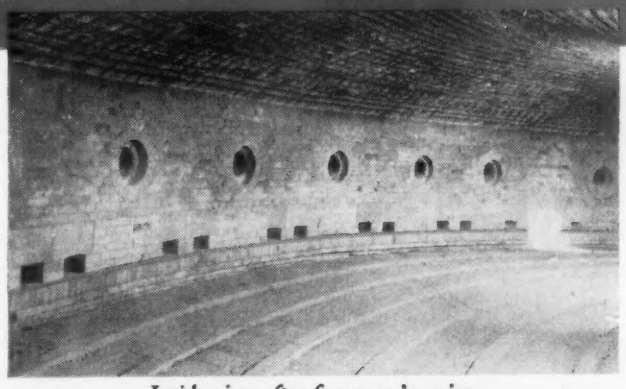
A plate of the desired alloy for the cladding is heated in a furnace under a flux. Following heating, the plate is withdrawn and, while at temperature, a box of thermit powder is positioned over it. The thermit powder is ignited, forming iron and slag which melts the box and deposits the iron slowly through the flux upon the surface of the alloy plate. In traveling through the flux, the thermit metal is cleaned or washed of slag and at the same time, by adjustment of the preheat and depth of the flux, its temperature is so regulated that fusion of the iron to the alloy occurs evenly over the entire face.

When iron has been deposited on the stainless or alloy plates, these are assembled with the steel slabs in contact with the iron face in a pack form, as indicated in Fig. 5, heated to the proper temperature, and rolled by a mill. The rolling operation welds the steel slab to the iron surface which has previously been fused by thermit to the alloy material.

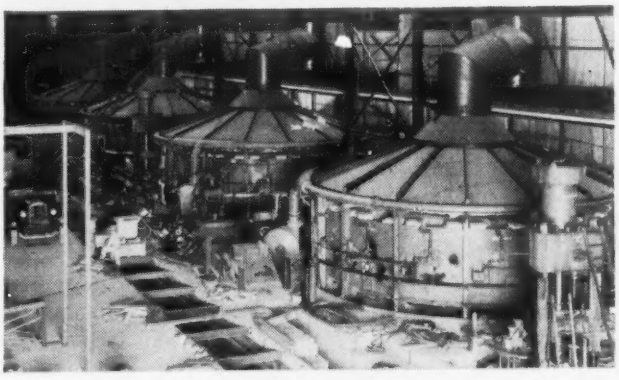
Various types of thermit powders may be used to suit the requirements. For example, nickel or stainless thermits may be employed. Thermit has the advantage of producing finely divided iron particles, superheated to approximately 5000°. These settle slowly through the flux and produce an evenly fused layer on the stainless plate. The accompanying table shows physical properties of a double stainless clad plate produced in this manner.

From presentation by the author at the Petroleum Conference of American Society of Mechanical Engineers, Houston, Texas, Oct. 5-8, 1947.





Inside view after five years' service.



SALEM ROTARY FURNACES

. . . offer automatic billet charging into the furnace on a predetermined and selective spacing.

Furnace discharge is controlled by an operator whose only function is to direct the peel at timely intervals to tie in with the mill, press, or hammer requirements.

Costly labor is greatly reduced*—a multiple installation of furnaces requires only one operator per furnace, regardless of rated capacity, and *one furnace tender for as many as four (4) units.

SALEM ENGINEERING CO. · SALEM, OHIO
SOUTHWEST OFFICE · FORT WORTH, TEXAS
SALEM ENGINEERING CO. (Canada) Ltd., TORONTO
SALEM ENGINEERING CO. • SHEFFIELD, ENGLAND

SALEM

ALL OFFICES STAFFED FOR ENGINEERING, CONSTRUCTION and OPERATION

Salem Builds

CIRCULAR SOAKING PITS
ROTARY HEARTH FURNACES
CONTINUOUS BUTT-WELD FURNACES
CAR BOTTOM FURNACES
FORGE FURNACES
HEAT TREATING FURNACES
NEEDLE METALLIC RECUPERATORS
AIR RECIRCULATING FURNACES
GAS ATMOSPHERE FURNACES
MECHANICAL EQUIPMENT FOR CHARGING AND DISCHARGING MATERIAL FROM FURNACES

Manufacture of a ⅝-inch thimbleye bolt is a good illustration of the combination of two methods of hot working steel. Round steel (0.618-inch diameter) is sheared off to a predetermined length in a multiple shear. Slugs are then heated to approximately 2400° F and inserted between dies in an Ajax upsetting machine. Here they are subjected to a three pass operation.

Steel is put into the first die groove and a punch upsets the 0.618-inch diameter to a diameter of ¾-inch while the shank is held between gripping dies. The piece is then lowered to the second pass and the ¾-inch diameter is upset by the next punch to 1-inch diameter. Third pass enlarges this 1-inch diameter to 1¼-in. round. These successive passes are necessary because stock will buckle if too much stock is upset at one time, a condition which will result in a fractured forging when completed.

This upsetting is performed for one purpose only; namely, stock is gathered into a ball to have enough material to form the head of the bolt. If this were not done, the bolt would have to be drop forged completely out of a much larger diameter stock and trimmed all over.

After upsettting, the bar is then inserted in the roughing pass of a 1000-pound board drop hammer and subjected to two hammer blows. It is then transferred over to the finishing pass of the hammer dies and given one blow. The upset ball of the steel bar has then taken a definite shape, the extra metal being squeezed out into a flash which is trimmed off. Hole in the eyebolt is also punched at the same time the flash is trimmed.

All these operations, three pass upsetting, two pass drop forging, trimming, and punching are done hot, the heat being retained in the piece by performing these operations as rapidly as possible. The eyebolt is then cooled and completed by pointing and cutting threads on it. After galvanizing, it is fitted with a nut and packed for shipment. A clearer understanding of these methods can be had by referring to Fig. 3.

The thimbleye bolt is a very simple forging to make, as far as the dropping is concerned. The company is called upon daily to manufacture products that, as a necessity, must be completely dropped all over, and many of the following operations have to be performed. It is not uncommon to perform all of them in one die in order to complete a forging: Fullering, edging, rolling, bending, blocking, finishing, trimming. Some examples of the more complicated forgings requiring many of the above steps are rail clips, dead end tongues, oval and thimbleye nuts, lifting plugs, and many other familiar forgings.

Cold Working — Cold working of metals as practiced in our plant can be divided for the purpose of our discussion, into two major groups; namely, those operations performed on round stock and operations on flat or shaped stock.

Cold working of round stock as practiced at Oliver is represented almost 100 per cent in the cold heading and subsequent trimming, extruding, pointing, rolling, or cutting operations performed after heading. Formerly, all upsetting was done hot; but largely because of the improvement in materials, most of the commercial metals and alloys are now malleable enough to withstand plastic deformation without failure at room temperature.

Demand from fastener users that shanks of bolts be smooth and free from scale and accurately sized, further developed cold upsetting and heading. Better die steels and more rugged equipment have further advanced the position of cold heading within industry today, because hand in hand with these items are the availability of closer tolerances.

Oliver now has in operation twelve boltmakers of National Machine Co. design and manufacture. These machines are the latest development in cold heading equipment and can produce approximately 12 million finished bolts per month.

In outlining the various operations required to make a bolt on these machines, steps required on a ¾ x 6 inch regular square headed 1020 machine bolt are typical of all sizes produced on these machines. Steel for this particular bolt is purchased by us in the hot rolled, coiled condition. It is stored in our wire room in quantities suitable to storage space and requirements. As it is needed, it is pickled in sulphuric acid, washed off with cold water, dipped in hydrated lime, baked, and taken to the machine.

Wire Preparation — Wire suitably prepared is then placed on horizontal reels in front of a Hogue wire drawing machine mounted directly in front of and powered by the boltmaker itself. The wire is fed through this drawing machine directly into the boltmaker feed rolls; in fact the rolls pull the wire through the drawing dies in the Hogue drawer as well as push the stock into the boltmaker. It is in this drawing operation that the baked coating of hydrated lime is drawn into the steel to form an adherent base for proper lubrication in the subsequent extruding and heading operations to follow.

Aluminum stearated powder is used to lubricate the wire while it is being drawn through the tungsten carbide sizing die in this machine. Wire enters this machine with a nominal size of 13/16-inch round with a tolerance of plus or minus 0.008-inch and an out of roundness tolerance of 0.0023-inch, but when drawn measures 0.790-inch plus or minus 0.001-inch and being round within a tolerance of 0.001-inch.

Wire is then pushed against a solid stock gage located on the right side of the machine. It is immediately cut or sheared off and carried over in front of the first station. This operation is similar to other header operations except that, due to the improved shear action on the bolt, maker, the cut-off end of the stock is squared off with the axis, whereas, the old style machines leave the end of the wire angular to the axis. This is a distinct advantage in that the stock stays central when headed; the metal flow is not one sided.

Extruding — The wire slug is then pushed into a tungsten carbide extruding die located in the first station by a header located in the heading slide. This die reduces the 0.790-inch diameter of the wire down to 0.735-inch diameter to a length equal to the length of the finished bolt from under the head. Remainder of the slug is stoved up to about 0.795-inch in diameter due to the pressure exerted on it by the header shoving it into the die.

Slug is then pushed back out of the extruding die when the heading slide is receding by a ram actuated kicker, grabbed by the transfer fingers and carried over in front of the second station die before the heading slide comes up again. It is in this station that the header, which is a plain cylindrical piece of high speed steel with a small counterbore in its face, pushes the once extruded piece of wire again into an extruding die and upsets the unextruded portion into a mushroom shape.

The 0.735-inch diameter is reduced to the pitch diameter of the thread, 0.675-inch, in this operation for a

To all our good friends, old and new,
we express sincere appreciation for thoughtful consideration
and understanding accorded us throughout the year.
With assurance of our best efforts to serve you in days
to come, we send

Season's Greetings

COLD ROLLED STRIP
POLISHED BLUE SHEETS
ELECTRICAL SHEETS
SEAMLESS TERNE ROLL ROOFING

FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES · PITTSBURGH 30, PA.
Sales Offices: New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee.
Sales Agents: Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle, Toronto and Montreal, Canada.
Plants: Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses: Pittsburgh, Pa., Rochester, N.Y. and Fairfield, Conn.

length equal to the length of the required thread. That portion of the shank, not extruded or mushroomed over, is stoved up to 0.737-inch in diameter in this operation. This second station die is also tungsten carbide die. The further extrusion adds more cold working to the threaded section of the bolt with the resulting advantages noted above.

Difference in this operation from regular heading machine operations lies in the fact that the metal going into the head of the bolt is being upset from 0.795-inch diameter stock, which is much larger than that in other headers which normally is 0.735-inch in diameter.

Trimming Station—Again the bolt is kicked out of the dies and transferred mechanically over to the next or third station. This is the trimming station. The bolt head is squeezed between the trimming die located in the heading slide and die in the machine bed until the thickness of the metal flash is about 1/64-inch thick. It is then broken off by having the bolt kicked through the die up into a transfer tube. This die is made of high speed tool steel.

Bolt is then pushed along this tube by other bolts coming along behind it to a pointer head. Here the bolt shank is pointed while it is being held in a vice-like gripping device by two revolving cutters.

After pointing, the bolt is again pushed by succeeding bolts along a slide, at the end of which the bolt is automatically injected between roller dies where the thread is rolled on it during the receding stroke of the heading slide. Roller dies are high speed tool steel made up of stationary and moving dies, the moving dies being located in the rear of and reciprocated with the heading slide.

In this operation the bolt blank, while unsupported on centers, is rapidly rolled laterally between these dies. The forming grooves in the dies are straight and are at an angle corresponding to the helix angle of the thread. The steel is not cut, but is cold formed into hills and valleys. Fibers of the steel, which are parallel to the axis of the shank, are thereby crimped, adding strength and toughness to the threaded section. Bolt is then ejected from between these dies into a tote box as a finished product ready for blueing and packing.

Cold Working Flat or Shaped Stock — Cold working flat or shaped stock which is the other major group in the cold working of metals is the forming, shaping, or cutting of steel by the use of many intricate dies and machines to produce a desired shape or product. Types of steel we employ for this type of product are numerous, the most common of which are flat sections, angular sections, channel sections, tee sections, and special formed flat sections. These steels are usually in the low carbon range and are all hot rolled sections.

Various sections are put through numerous operations before the desired shape is finally obtained. Some of these operations are shearing, punching, blanking, drawing, bending, pressing, stamping, coining, welding and riveting. This type of cold working of metal is best represented in the plant by the Pole Line Hardware division.

Manufacture of a cross arm brace perhaps offers the simplest combination of operations (punching and shearing) that can be found. A 28-inch heavy brace is made from 1¼ x ¼-inch hot rolled steel purchased in 30 foot lengths. These flat steel bars are pushed between dies located in a light press by an operator, and the finished brace is produced with one stroke of the press.

Dies are of the simplest design. There are two punching dies (square blocks with round holes of the required diameter extending through them) located in a holder in the bed of the machine, two punches located in a holder on the ram of the machine directly above the dies, and a shear blade mounted on the ram of the press.

The press ram when it descends on the first piece of the bar, punches two holes in the bar. The bar is then fed forward, when the ram goes up against a gage, and upon descending again, punches two more holes in the bar, but at the same time, shears off the previously punched piece, Fig. 3.

More complicated production steps are required on the No. 2338 heavy type secondary rack. Manufacture of this rack involves making several parts and subsequent assembly of these. Parts are the rack back, points, and rack bolt. Manufacture of each part involves different types of cold working of metal, Fig. 2.

Tungsten, Copper, Nickel Alloy Has Great Density

An alloy of tungsten, copper and nickel possessing a density said to be 50 per cent greater than lead has been introduced and reportedly is applicable to the design and construction of moving parts possessing maximum inertia and minimum size. Developed by the Metallurgy Division of General Electric Co., Pittsfield, Mass., for original use on a gamma ray screen, the new material, called Hevimet, may be used in the construction of balance weights for the elimination of crankshaft vibration, air screws, centrifugal clutches and other rotating parts, the company states.

Properties of the alloy are said to include great tensile strength, good machinability and high resistance to atmospheric salt water corrosion. It may be plated with cadmium, chromium and nickel and may be silver soldered and brazed. A sintered material, it is made in variety of nonporous sheets and blocks. Complex shapes reportedly may be built up from pressing by a special process of hydrogen welding.

Protective Metal Coating Bibliography Published

Author, title, price, reference number and a brief abstract are given for each of the 230 reports listed in the bibliography of technical reports and documents on protective coatings for metals published by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Included are research reports and patent applications from I. G. Farbenindustrie in Germany as well as various specifications of the U. S. Bureau of Ordnance and reports on Quartermaster Corps investigations.

Offered free of charge, the bibliography lists reports presenting technical information on a large number of protective coatings, such as: Synthetic coatings for gasoline tanks, oxidized finish for brass, rust preventive coatings for steel, wax coatings for electrical components, phosphate coatings, coating agents for magnesium and magnesium-aluminum alloys, organic coatings, vitreous enamel coatings on aluminum, etc.

Metalworking Equipment

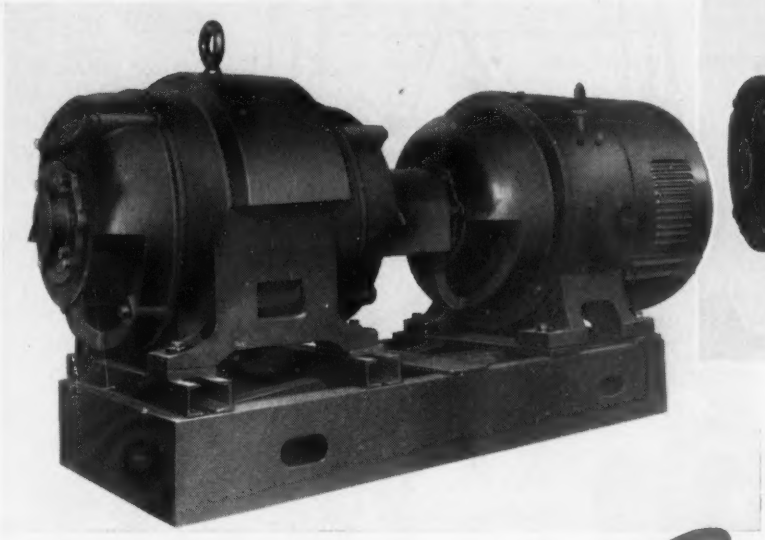
(*Concluded from Page* 63)

imperfections are ironed out.

The merry-go-round conveyor, Fig. 2, carries dollies on which sides of panel bodies are assembled. Special fixtures hold the piece firmly in position, while stockpiles of parts are conveniently located near the various assembly stations.

Portion of one of the door assembly lines is shown in Fig. 6. Outer panel and frame move through preliminary spot welding operations to the automatic press welder in the background. This "sews" the two together entirely around the panel.

Century 125 horsepower motor generator set with the Synchronous motor excited from the DC generator.



Century 50 horsepower Synchronous motor with direct connected exciter.

CENTURY *Announces*

A NEW LINE OF

SYNCHRONOUS MOTORS

For Power Factor Correction

- **Type SY Synchronous Motors**
- **Type SYN Synchronous Motor Generator Sets**

Now available is a new line of Century high speed Synchronous motors from 25 to 150 horsepower, unity power factor, and 20 to 150 horsepower, 0.8 power factor — to meet the requirements of power factor correction.

Century supplies these motors without exciters when another source of direct current is available for excitation.

Century builds a complete line of fractional and integral horsepower electric motors and generators, in the popular sizes to meet the requirements of industrial production, processing, commercial and appliance needs.

Specify Century motors for all your electric power requirements.

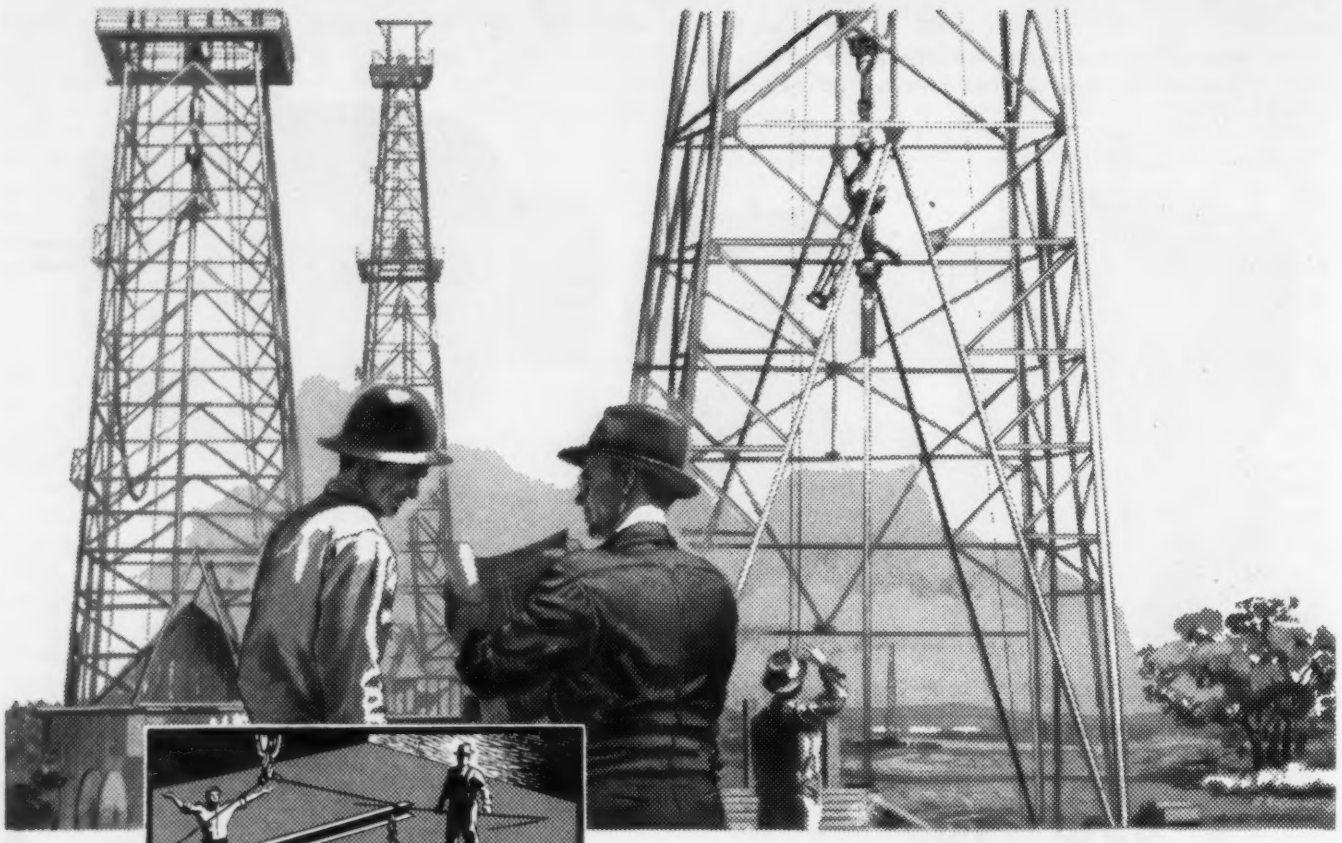
Century C MOTORS

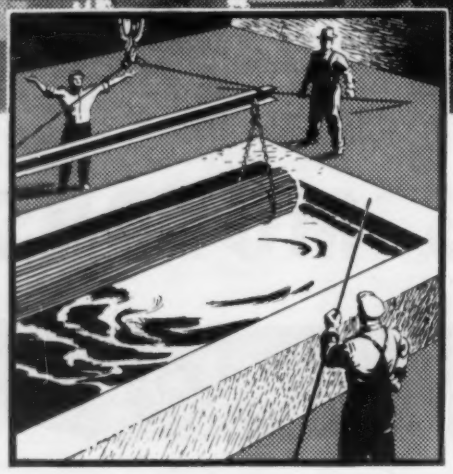
CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri

Offices and Stock Points in Principal Cities

557

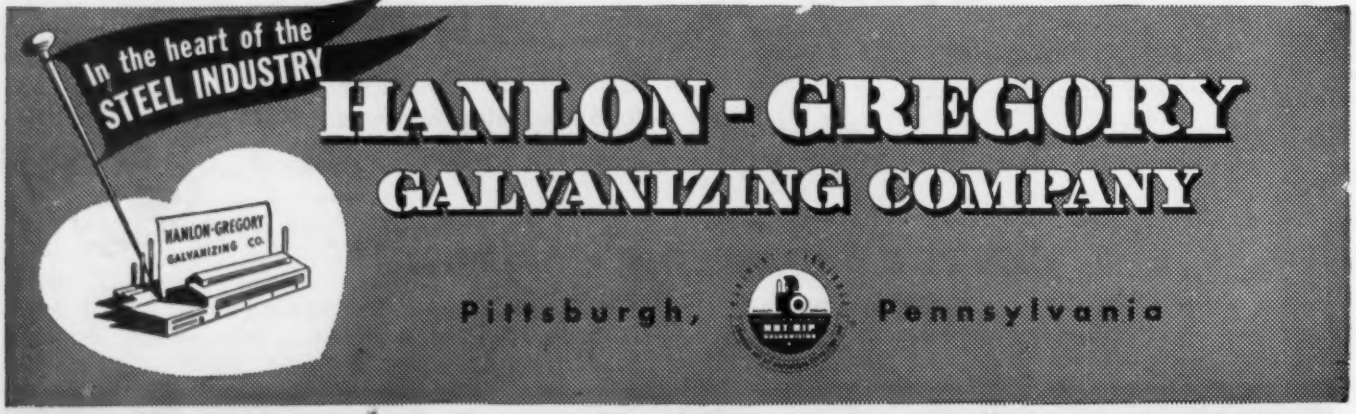




Hot-Dip Galvanized Derricks *Last Longest*

Light structural steel for permanent or portable installations—protected against the elements with the best possible coating of zinc by the Hanlon-Gregory method of Hot-Dip Galvanizing—*will* prevent rust, render greater uninterrupted service and eliminate maintenance costs. The world's largest Hot-Dip Galvanizing plant—located in the heart of the steel industry, is equipped to galvanize *your* metal products whatever they may be. There is capacity for quantities of any size from truckloads to carloads.

THE WORLD'S LARGEST JOB GALVANIZING PLANT



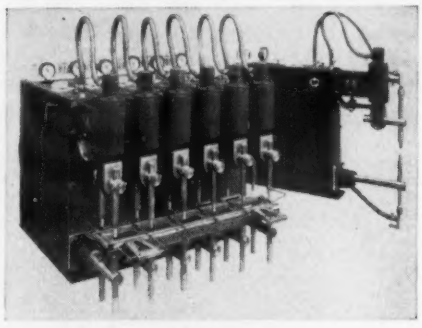
GALVANIZING . . . PICKLING AND OILING

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 98

1. Spot Welder

Suitable for use as a general purpose bench mounted welder, or ganged for multiple production, an automatic narrow spot welder, made by Metron Instrument Co., 432 Lincoln St., Denver 9, Colo., is a complete unit in itself. Although only 4 inches wide, each unit incorporates controlled air operated electrode pressure, adjustable current setting, water cooling of transformer and



electrodes and automatic pressure initiation of current.

A foot-actuated air valve controls the complete welding sequence. Electrode pressure is adjustable from nothing to approximately twice air line pressure. Built-in electronic timer controls current duration from 1/30 to 2 seconds. Dimensions of each unit are 4 x 24 x 32 inches with a 12 inch throat.

2. Aluminum Conveyor

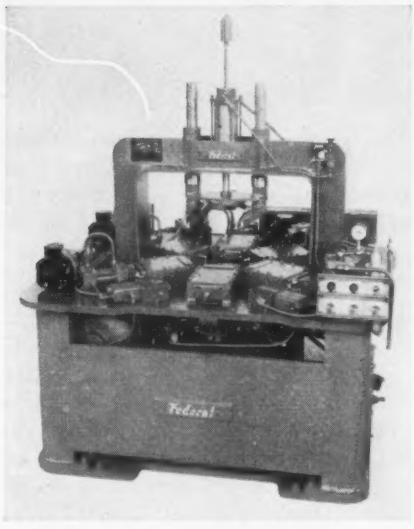
Made entirely of aluminum, except for hardened ball bearing race ways and the ball bearings, a new standardized Load-Veyor conveyor, made by Market Forge Co., Everett 49, Mass., weighs only 30 pounds for a 10 foot length. Each of its aluminum wheels is supported on both sides, the grid-like structure providing strength in all directions.

Either side of the conveyor may be used. Wide articles are intended to be conveyed on one side on which the wheels project above the side rails. Smaller articles may use the other side where the side rails are above the wheels, acting as guides.

3. Projection Welder

Equipped with two locating current carrying dies and one hydraulic cylinder operating clamp die, a triple head projection welder, made by Federal Machine & Welder Co., Warren, O., is designed for welding mounting brackets to cooling fins on compressor assemblies. Three projection heads are hydraulically operated and incorporate spring clamping devices for locating the brackets. Heads operate in slides and are arranged so that brackets are held to a tolerance of plus or minus 0.010-inch.

Welder is equipped with a 150 kilovolt ampere transformer wired for 440 volt, 60 cycle current, with eight



steps of heat regulation. One transformer is used, with one side of the secondary winding connected to each of the clamping locating current carrying dies, and the other side connected to each of the welding heads.

4. Overload Jack

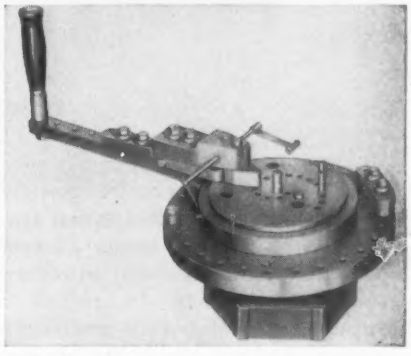
Press overload is avoided and damage to punch press crank and frame is eliminated with the model HJ hydraulic overload jack and connecting rod, made primarily for large single and double crank straight side punch presses by Dayton Rogers Mfg. Co., 2835 12th Ave. South, Minneapolis 7, Minn. Replacing the present connecting rod or strap, including strap crank pin bearing and adjusting screw, it supplies a connecting link between the crank bearing and ram, with hydraulic overload jack calibrated at press' maximum tonnage.

Furnished dribble pump, actuated from a cam on the throw of the press, maintains a constant preloaded pressure on the jack cylinder. In the event the press is overloaded beyond the predetermined pressure, the entire jack mechanism telescopes, allowing press to continue throughout the work cycle of the press crank. Mechanism is built to sizes from 50 to 500 tons working capacity.

5. Bending Machine

Forming and duplicating of a variety of parts and pieces on a production basis is possible with the Di-Arco bender No. 1A, designed by O'Neil-Irwin Mfg. Co., Lake City, Minn. It is capable of forming large radii in light weight materials at a high rate of production. Shapes and outlines impractical or impossible to obtain by other means may be produced.

All types of ductile materials such as round, half-round, hexagon and



square rod, tubing, angle, channel, molding, strip stock and bus bar may be contour formed with the machine. Model 1A has a radius capacity of 0 to 6 inches and an operating leverage of 16 inches. Height of forming nose is ¾-inch but may be readily increased. Degree of radius forming is set by adjustable stops.

6. Gas Welding Electrode

Because the proper amount of flux is already on the rod, a separate fluxing operation is unnecessary with "ready-flux-coated" EutecRods, made by Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y. Continuous presence of flux insures instantaneous bonding at the lowest possible temperature and improves the quality of the deposited metal.

New rods are available for all

types of metals such as cast iron, steels, brass, bronze, copper nickel, aluminum and magnesium. Brush fluxing is necessary only in long lap joints. These rods, used in gas welding of these various metals, are offered in sizes from ⅛ to ¼-inch, depending upon metal to be welded.

7. Index Table

For use with the Multipress or Multi-Unit made by the company, the completely self contained six station index table, manufactured by Denison Engineering Co., 1160 Dublin Rd., Columbus 16, O., may be used with any equipment where a source of hydraulic power is available. All action is interlocked—ram cannot descend while table is in motion and

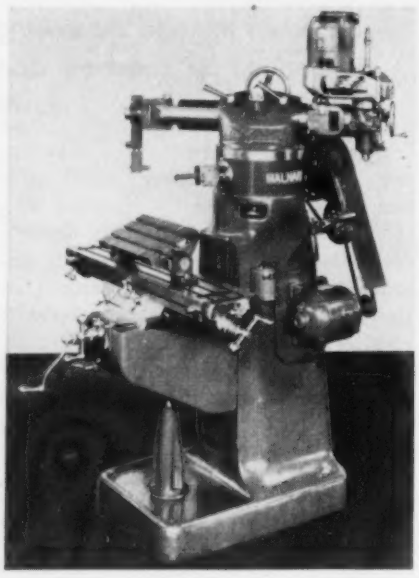
table cannot rotate until ram has completed its cycle.

Fluid motor is equipped with speed control regulation, permitting 10 to 70 indexes per minute. When used with the Multipress, action of table and press is completely automatic. Provision is made to permit a "through" punching at a station 120 degrees on either side of the pressing station. Air blast or mechanical knockout ejection may be used.

8. Horizontal Mill Unit

Both horizontal and vertical work may be done without resetting on a Bridgeport vertical milling machine equipped with a horizontal milling attachment made by Malnar Machine & Tool Co. Inc., 19301 St. Clair Ave., Cleveland 10, O. The attachment unit is permanently centered on zero and the vertical swings back to zero as well.

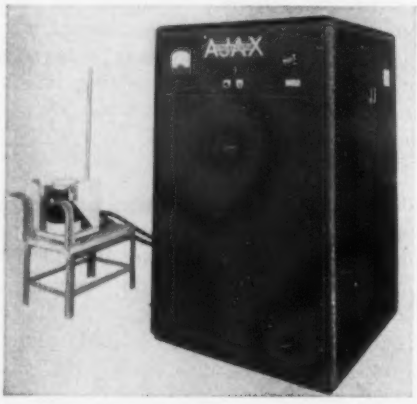
Resetting for changing from vertical to horizontal milling is eliminated with the unit. Horizontal spindle is strong enough for heavy end milling, fly cutting, boring, drilling and other operations. Spindle has a Brown & Sharpe standard No. 10 taper, but tapers up to No. 40 are available. Variable speed transmission with a 1 horsepower motor furnishes spindle speeds from 125 to 1800 revo-



lutions per minute. A work table which enables work to be tilted from 0 to 45 degrees in either direction is offered at extra cost, fitting on the machine table.

9. Frequency Converter

Simple controls and safety interlocks are features of the new 20 kilowat high frequency converter for induction heating and melting, developed by Ajax Electrothermic Corp., Ajax Park, Trenton 5, N. J. All parts of this Ajax-Northrup converter are enclosed in one semiport-



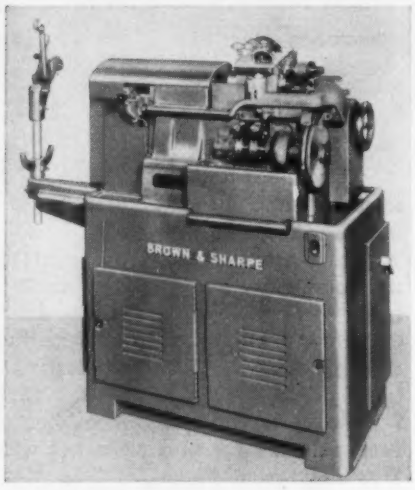
able unit measuring 44 x 44 x 58 inches. One control knob is needed to adjust it to the proper power output.

Electrical circuit of converter is self-tuning, with frequencies varying from 20,000 to 80,000 cycles per second, depending on size and shape of furnace coil to which it is connected. Of the spark-gap type, it has specially tipped copper electrodes in the hydrogen atmosphere, water cooled spark gap chamber. Power supply to converter is single phase, alternating current, usually 208, 220 or 440 volts.

10. Pinion Turning Machine

Maintenance of accurate operation without highly skilled operators is possible with the automatic pinion turning machine recently announced by Brown & Sharpe Mfg. Co., Providence 1, R. I. Incorporated in its design are circular-formed single point tools, built-in tool resetting indication and centering gage and individual micrometer stops for each of the eight tool positions.

Only two cams are employed in the drive mechanism—both mounted



close together on the same drive shaft to eliminate torque distortion. As much as 4:1 ratio of cam lobe rise to longitudinal feed further increases inherent accuracy. Change gears provide rates of production from 3 to 364 seconds for one piece per cycle. Sixteen spindle speeds, from 910 to 10,000 revolutions per minute, are provided. Two horsepower motor-driven machine takes stock to ¼-inch diameter and turns up to 2⅞-inch lengths.

11. Vertical Grinder

Designed for grinding faces of various tools, a new vertical spindle full hydraulic grinder, developed by Charles H. Besly & Co., 118-124 North Clinton St., Chicago 6, Ill., features a feed fixture into which the rough forging is placed. Fixture then swings down into horizontal position, advances to the grinding wheel, makes the required number of passes back and forth across the wheel and, at the same time, feeds down me-

(For more information, use the card following page 98.)

SOLVED!

THE COMPLEX PROBLEM OF

INVENTORY CONTROL

Certified protection against fire at point-of-use. These four Floor Model Safe-Kardex units protect the Frank D. Palmer materials control record twenty-four hours a day. Each unit may be wheeled to any part of the office for maximum working convenience.

At

Frank D Palmer Inc
Chicago

A TOUGH CASE? Yes, but it cracked in a hurry when a Remington Rand system was applied to the inventory control requirements of this famous machinery manufacturer.

As producers of highly individualized packaging equipment, Frank D. Palmer, Inc. are faced with material and tool control problems far more intricate than those of companies making standard products. Not for just one but for *every* customer's order, they must know and anticipate:

- WHAT TO ORDER
- WHEN TO ORDER
- HOW MUCH TO ORDER
- FROM WHOM TO ORDER
- HOW MUCH IS ON HAND
- HOW MUCH IS RESERVED FOR ORDERS IN PROCESS
- HOW MUCH REMAINS DUE

Similar problems apply to their procurement of tools. Many are specially made—and costly. Rigid control must be maintained on allocations, both to jobs and to individual workers. Excessive breakage or loss of valuable tools must be quickly traced and corrected.

Heart of their System—Visible Records

PALMER'S MATERIAL CONTROL is now set up in a Kardex system that provides a four-year history of usage, vendors, and prices as well as current balances—with all facts on each item centralized in a single visibly-indexed pocket. The Graph-A-Matic signal on the visible margin flashes prompt warning when executive review is required of materials on hand, on order, reserved or past due.

At the same time, the tool record provides positive control over usage, breakage and loss, based on the same Kardex *visible* principle—with an additional provision for filing tool *charge-out* slips in the record pocket.

With this scientific system Palmer avoids excessive investment in inventory—yet makes certain that sufficient stocks are on hand, when required for production.

Whether *your* inventory involves thousands of items or relatively few, Remington Rand visible systems bring you closer, more economical control, faster posting, easier reference and lower clerical costs.

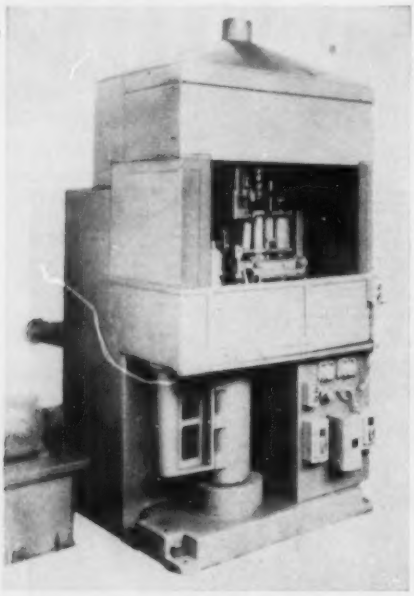
For more facts on how to solve your particular inventory problems, telephone your nearest Remington Rand office or write: Systems Division, 315 Fourth Ave., New York 10, N. Y.

Remington Rand

THE FIRST NAME IN BUSINESS SYSTEMS

chanically. Upon reaching a micrometer stop screw, work automatically recedes and returns to unloading and loading position.

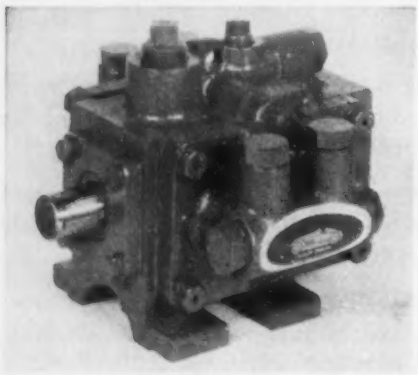
Machines may be used in pairs, one finishing each side of the forging. The number of passes across the grinding wheel, speed of the



passes, amount of hydraulic pressure exerted and speed of the downfeed are subject to variation at operator's option. Two of the machines, designated as No. 320, can be run by one operator.

12. Hydraulic Pump

A four-piston hydraulic pump weighing only 30 pounds and which will operate in either direction of rotation without further modification is announced by Miller Hydraulic Engineering & Sales, 3615 Hart, De-

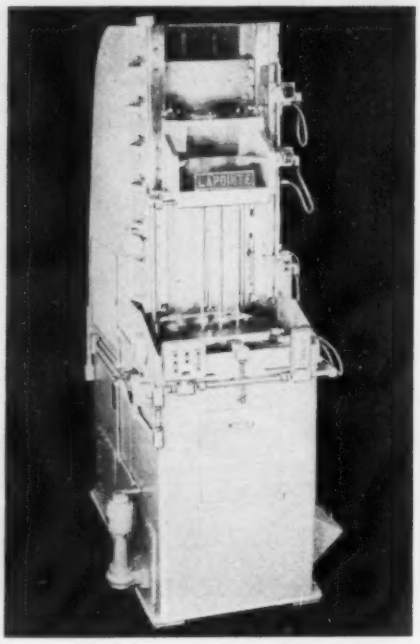


troit 14, Mich. Its four pistons are horizontally opposed.

Hardened steel throws are keyed to the drive shaft. The one piece forged bronze connecting rods have ball ends which take the pumping load on the inside of the piston dome. Relief valves are factory-set to the desired pressure. At 1200 revolutions per minute, the discharge pressure ranges from 0 to 3000 pounds per square inch and the delivery from 5.4 to 3.0 gallons per minute.

13. Broaching Machine

Jobs in which the center distance between simultaneously broached holes must be held are jobs for the model V-3 vertical hydraulic pull down broaching machine, built by Lapointe Machine Tool Co., Hudson, Mass. This machine is similar to the company's standard V-3 machine, but is heavier throughout and incor-



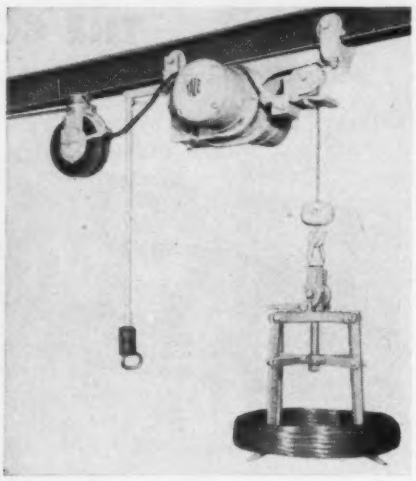
porates a broach guide for maintaining vertical accuracy alignment.

Machine is provided with a standard in and out fixture and is tooled to broach three different sizes at one time. With its rotor cut broach it can cut multiple holes and hold their center distances to within 0.0005-inch of each other.

14. Cable Hoist

Developed for "wire stripping" in the steel mill, but useful in other fields where use of a stiff arm for manual spotting to close tolerance is important, the new electric hoist made by Yale & Towne Mfg. Co., 405 Lexington Ave., New York 17, N. Y., is offered in capacities of 500, 750, 1000 and 1500 pounds. Stiff arm is rigidly built so that it may be used laterally to push a bridge-beam or jib on which it may be mounted, as well as to push the hoist itself.

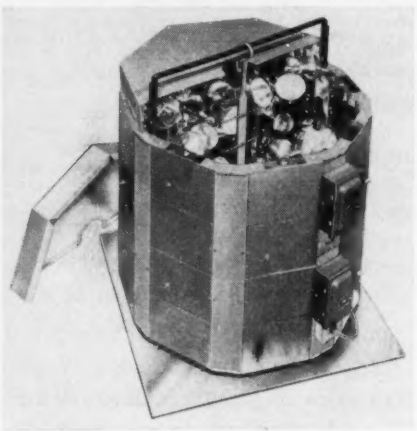
Various lifting speeds and heights are available for the hoist which requires 15¼-inches headroom. Hoisting and lowering is by push button



control from end of the stiff arm. It is weatherproof and dust tight. Limit switches restrict raising and lowering within desired range. A motor brake permits close inching of cable and hook.

15. Plating Rack Dryer

Preheating and final baking operations essential to proper processing of electroplating rack coatings may be carried out in the Rack-Tab, developed by Miskella Infra-Red Co., East 73rd and Grand Ave., Cleveland 4, O. Heat is furnished by 32 infrared bulbs and may be varied



between 70 and 400° F by a variable control unit.

Processing using this rack dryer is as follows: Bare rack is preheated for a few minutes, then dipped in primer; it is again baked for 5 minutes at 200° F; after another preheating, it is dipped in unreduced thermoplastic, withdrawn slowly and baked for 10 minutes at 350° F. The dryer is portable and is shipped ready

(For more information, use the card following page 98.)

This $500,000 picture needs $4,745 more . . . Do you see WHAT'S MISSING?

These floating derricks valued at $500,000 can't operate without the wire rope which is missing in the picture. It costs about $4,745 to equip the derricks with Preformed Wire Rope made of Improved Plow Steel. That's only $790 more than ordinary wire rope—and Preformed is far more economical.

When you buy any machine rigged with wire rope, make sure it comes equipped with Preformed. More and more manufacturers are standardizing on Preformed for their original equipment because it improves performance of their products. It's a money-saver because it lasts longer. It's easier and safer to handle.

Write for Free Copy of helpful book about Preformed. Address the Preformed Wire Rope Information Bureau, 520 N. Michigan Avenue, Chicago 11, Illinois.

Ask your own wire rope manufacturer or distributor

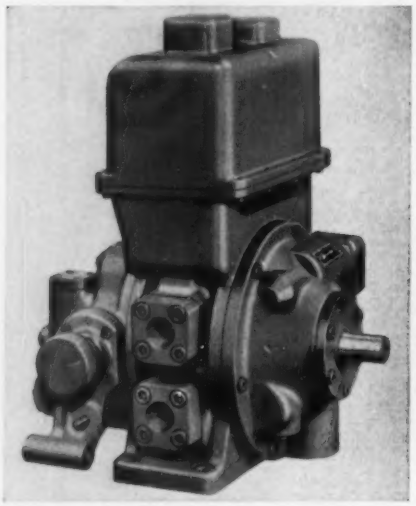
PREFORMED WIRE ROPE

LASTS LONGER
HANDLES EASIER

to plug into a single phase 230 volt line. Total load is 8 kilowatts or 35 amperes. Two heat zones, each controlled by a 30 ampere fused switch, enable half to be cut off for processing shorter racks. Average capacity is 24 large racks per 8 hours.

16. Variable Delivery Pump

Electro-hydraulically controlled, a new variable delivery feed pump, built by Oilgear Co., Milwaukee 4, Wis., has fine and coarse feeds which may be preset over a 20:1 range, maintained by an automatic pressure compensator built in the pump control. Pump, which is radial piston type, has a gear pump built in



the front drive shaft housing to deliver a large constant volume to traverse to and from working position at high speed. Its ratios vary from 13:1 to 265:1.

Dual, direct solenoid actuated, built-in control valves provide quick control functions in response to remote pushbutton or limit switch. Over-travel is eliminated. Should power or both solenoids fail, control valves automatically move to neutral position and carriage stops. Two pipes are required for installation.

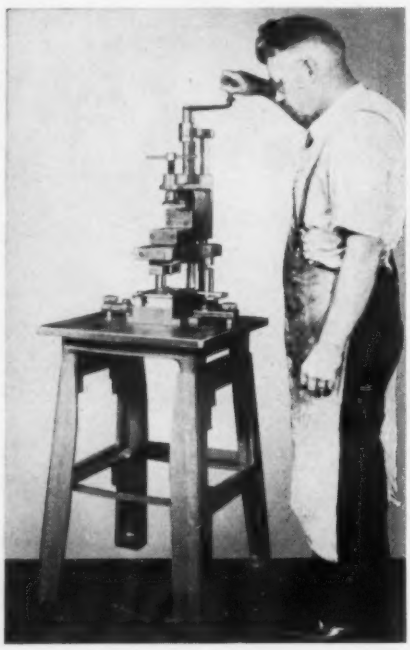
17. Chain Hoists

Full weight accurately cast sheave wheels, high tensile malleable iron frames with reinforcing ribs, drop forged heat treated hooks and lower hook mounted on ball thrust bearings are features of the line of differential chain hoists announced by Chester Hoist Co., Lisbon, O. They are capable of severe punishment and have a high safety rate.

Hoists will hold their load at any point—they will not self-lower. They are made in ¼, ½, 1 and 1½-ton capacities. Use of few parts decreases weight and increases portability without sacrificing strength.

18. Punch Holder Remover

Removing die punch holders from die beds with guide pins and the separation of assembled punches and dies is facilitated with the punch

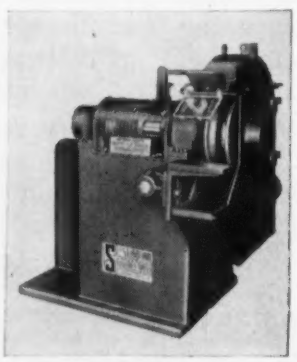


holder remover developed by Producto Machine Co., Bridgeport 1, Conn. In addition it may be used for shearing in small punches and dies and tryout work on light gage material.

Punch holders are quickly and easily removed, avoiding damage to expensive punches and dies and with considerable savings in time.

19. Snagging Grinder

An interlocking speed control prevents overspeeding of the grinding wheel on the single end snagging



grinder developed by Standard Electrical Tool Co., 2504 River Rd., Cincinnati 4, O. Illustrated is a 24-inch, two-speed, 10 horsepower grinder which, like others in the series, has a safety hinged door guard of boiler plate steel with adjustment to compensate for wheel wear.

Equipment includes exhaust outlet, adjustable spark breaker, safety glass eye shield and shaft lock for use in changing wheels. Work rest surface measures 4 x 9 inches. Ball bearings are fully protected, being mounted in oil reservoirs. Grinders are offered for right or left hand operation, for vitrified or resinoid bond wheel and in sizes for wheels ranging from 10 to 30 inches.

20. Die Truck

Designed for high production shops and factories where heavy dies, stampings, forgings, jigs or fixtures are moved from one location to another,

a new heavy duty die truck, made by Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich., is constructed of heavy fabricated steel plate.

Roller conveyors may be put on the truck bed to facilitate handling. Each truck features a fifth wheel or caster type construction, with thrust bearings. It is furnished with rubber tired or metal wheels equipped with tapered roller bearings.

21. Air Arbor Presses

An unlimited range of lengths in the solid steel shafting that forms the upright columns of air arbor presses is available from the press manufacturer, Air-Trol, 2651 West Lake St., Chicago 12, Ill. With this shafting, normal ram clearance of 0 to 6 inches in the standard units may be increased to any clearance required for special applications.

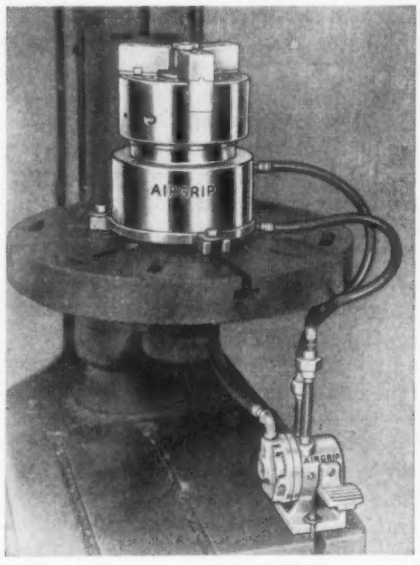
Also available from the company are supplementary or replacement cylinders for the presses with ram stroke of any length desired. A rapid socket wrench adjustment for

(For more information, use the card following page 98.)

ram clearance, with no fixed positions required permits hair-line vertical adjustments for ram clearance and swiveling of cylinder bracket on column to obtain better ram alignment.

22. Drill Press Air Chuck

An Airgrip drill press chuck and cylinder combination with foot control air valve is being marketed by Anker-Holth Mfg. Co., 2723 Conner St., Port Huron, Mich., for installations where neither chuck nor table revolves, such as drill presses, assembly benches, milling machines and special tapping machines. Chuck



and cylinder combinations may be furnished with either solid or hollow centers, the open center permitting the work to drop through the unit when released.

Chucks hold work piece either internally or externally. Valve automatically locks into position when operator applies initial pressure. To release the valve, pressure is merely applied again.

23. Decarbonator

Built in four sizes for capacities to 1800 gallons per hour, model CDC decarbonators are being manufactured by Cochrane Corp., 17th St. and Allegheny Ave., Philadelphia 32, Pa. Water to the unit, controlled by a pilot-actuated regulating valve, is distributed over a packed tower. A motor driven blower in a spool on top of the corrosion resistant plastic coated welded steel shell draws air up through the tower counterflow to the water, scrubbing the water free of carbon dioxide.

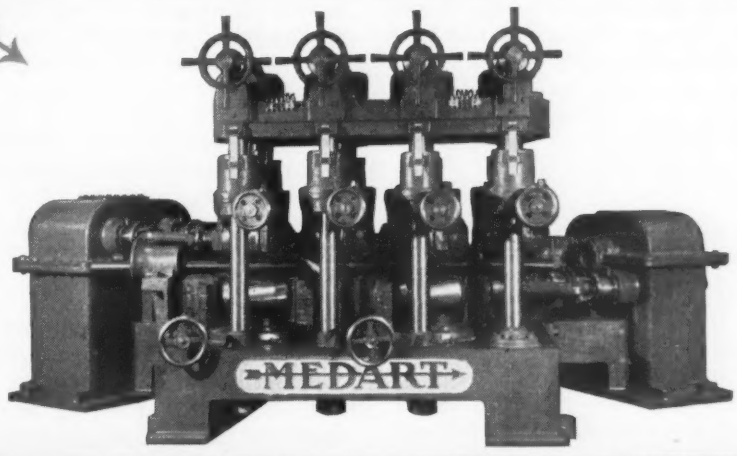
An air inlet filter prevents contami-

MEDART MULTICYCLE
PIPE AND TUBE STRAIGHTENING MACHINE

"6 in 1"
SIX POINTS OF SUPERIORITY IN ONE

1. MULTICYCLE STRAIGHTENING—Two bending rolls impose duplex straightening cycles on workpiece insuring end to end straightness.
2. POSITIVE AND SYNCHRONIZED FEED—All four feed rolls are driven insuring positive synchronized feed and torque balanced around neutral axis of workpiece.
3. THE WORKPIECE LEVEL—Maintains one feeding level for all sizes of pipes or tubes—eliminates need of adjustable entry and delivery tables.
4. NO GUIDES—Horizontal position of the six rolls with balanced torque eliminates requirement for guides.
5. SINGLE MOTOR—All four driven rolls powered from a single motor, for synchronization and economy.
6. NO BEVEL GEARS—All gears enclosed in cases and running in oil, for sure trouble free operation.

"Patents make Jobs"



MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

MEDART

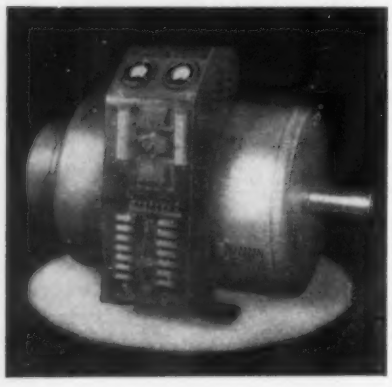
THE MEDART COMPANY • 3500 DE KALB ST., ST. LOUIS, MO.

nation of the water with dust. Unit is regularly used to remove carbon dioxide from the effluent of demineralizing systems, carbonaceous hydrogen zeolite softeners and from water supplies treated with acid. Iron is oxidized by aeration, precipitating in the form of a hydrate.

24. Generator

Revolving-field generator, direct connected exciter, automatic voltage regulating circuit, meters and selector switch for presetting voltage are included in the factory assembled "packaged" generator unit offered by Electric Machinery Mfg. Co., Minneapolis 13, Minn. Only external connections needed are leads to a generator switch.

Built-in automatic voltage regulating circuit has no moving parts and



requires no maintenance. It is permanently connected and adjusted to hold terminal voltage within 2 per cent of voltage selected, at any load or power factor within the generator rating. The principle of electrical resonance, used for needle-sharp tuning of radios, is used to hold constant voltage.

DEVELOPED BY . . .

25. Air Reduction Sales Co., New York 17, N. Y., flux for oxyacetylene welding of stainless steels and high chromium bearing alloys. Designated as formula No. 34, it is applied by painting the surrounding surfaces to be welded.

26. Fusion Engineering, Cleveland 15, O., production alloys for silver brazing and soldering which make possible "micro-film" joints in which a thin layer holds the pieces securely together. Three temperature ranges are offered.

27. Flynn Mfg. Co., Detroit 26, Mich., No. 12 offset boring head with compact body which permits extension of tool block nose beyond the body for getting closer to the work on recessed jobs. It has a micrometer adjusting screw.

28. H. T. Howald Machine Works, Brooklyn 31, N. Y., carbide milling cutters with sharp blade lock on shell and face mills and cone blade lock on replaceable blade end mills for ease in replacing and making blade adjustments.

29. Whitman Co., Los Angeles 23, Calif., Vitroseal, refractory coating for preventing spalling action, resisting heat penetration and decreasing carbon, slag and clinker adherence in fire boxes, furnaces and crucibles.

30. Merrill Brothers, Maspeth, N. Y., a dual clamp which makes possible the straight-up lifting of metal barrels. It consists of a cross arm the width of the barrel with a Volz clamp on each end of the arm.

31. H. H. Sell Electric Co., Minneapolis 11, Minn., self contained Selco phase rotation indicator. It is made to operate between 50 and 600 volts, 25 to 120 cycles and on 2, 3 and 4-phase current.

32. Super Tool Co., Detroit 13, Mich., line of standard carbide-tipped drills for drilling holes in dies, fixtures, etc., after the metal has been hardened. Ten sizes from 3/16 to 3/4-inch are offered.

33. Coffing Hoist Co., Mighty Midget puller for lifting or pulling 500 pounds in spite of its portable size. Weighing 6 1/2 pounds with chain, its handle may be used as high speed crank or ratchet lever.

34. Ohio Injector Co., Wadsworth, O., a corrosion resistant stainless steel valve, manufactured in 1/2 to 2-inch sizes. It is outside screw and yoke type with bolted bonnet, tapered wedge and screwed ends.

35. Metal-Clean Solvent Corp., Chicago, Ill., space saving continuous rotary drum type washing units, varying from 3 1/2 to 9 feet in length. From 700 to 900 pounds of small parts may be handled per hour automatically.

36. Westinghouse Electric Corp., Pittsburgh 30, Pa., hydrogen free, mineral type, extrusion coated electrode which eliminates underbead cracking. They may be used on alternating and direct reverse polarity current.

37. New Method Steel Stamps Inc., Detroit 7, Mich., multiple line interchangeable type holder for machine stamping of metals. All insert monotypes are hardened and ground to standard size.

38. Binks Mfg. Co., Chicago 12, Ill., model 18 precision production spray gun for all types of finishes. Controls are located at back of gun. Spray pattern is adjustable from round to flat.

39. Flexrock Co., Philadelphia 4, Pa., synthetic resin base penetrating Colorflex for color coating inside and outside over wood, concrete, masonry and metal.

40. Stackbin Corp., Pawtucket, R. I., heavy gage aluminum Stackbins, individual hopper-fronted stacking bins designed for storage, transportation and assembly of tools, parts and materials.

41. Bijur Lubricating Corp., Long Island City 1, N. Y., constant feed gear pump of 50 cubic centimeters per minute capacity at 100 revolutions per minute.

42. Palo-Myers Inc., New York 7, N. Y., the Palo time switch Sr., a self contained 110-volt, alternating current unit which will turn on and off any type of electrical laboratory apparatus on a predetermined time schedule.

43. Thomson Industries Inc., Manhasset, N. Y., an unlimited travel antifriction ball bearing for linear or reciprocating motion. Series A ball bushings are offered for 1/4, 1/2, 3/4 and 1 inch diameter shafts.

44. Coral Designs, Forest Hills, N. Y., sensitive static pressure controls for application on very low pressures where regulation is required in inches of water, either pressure or vacuum.

45. Dodge Mfg. Corp., Mishawaka, Ind., pin type flexible coupling incorporating a taper lock bushing which insures firm fastening. It may be disconnected without moving coupled machines.

46. Gairing Tool Co., Detroit 32, Mich., E-Con-O-Mill carbide face mill in 5-inch diameter sizes and over. Square tool-bit blades, are furnished with all clearance angles ground to a gage.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

HEAVY BACKLOGS—Steelmakers will enter the new year with heavy tonnage carryovers and prospects for continued active demand well into the future. Nevertheless, as the industry rounds out the most active peacetime year in history, there are signs some mills are catching up somewhat on arrearages, and the view is being voiced that by the beginning of second half of 1948 at least, modest easing in supply conditions will be evident. However, this easing is not likely to permit supply-demand balance in those products in most acute supply—sheets, strip, pipe and plates.

TIGHT SUPPLY—Sheet buyers report supply of all major grades, including enameling stock, is far short of requirements with prospects of an even more stringent situation during first quarter. Most consumers look for little improvement in conditions before second half. Even stainless sheet supply is tightening due to utensil and household requirements as well as broadening automotive applications. Other alloy products are reported somewhat tighter also, though still in relatively easy supply. Further, following a period in which there appeared to be some easing, hot carbon bar supply has tightened and a more stringent situation in cold-drawn bars is reported developing.

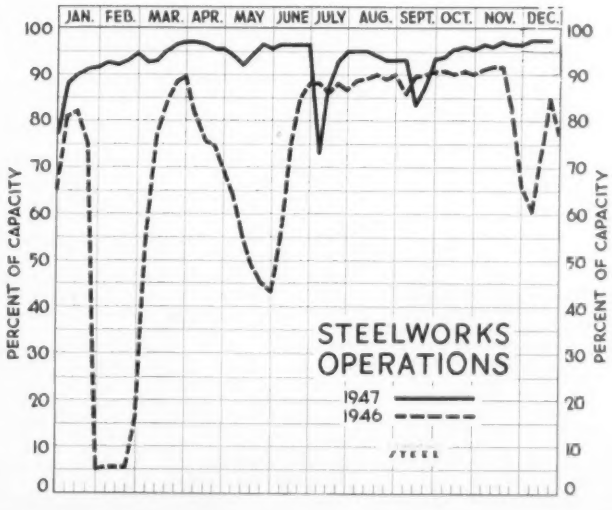
HOLIDAY INFLUENCES—Some slackening of demand pressure is expected over the holidays. As a matter of fact, ordering already has eased though consumers continue to request uninterrupted shipments on old contracts. Christmas week plant shutdowns may enable some manufacturers to accumulate badly needed inventories. Steel mill operations will be affected somewhat by holiday observance. Increasing difficulty is reported by foundries in covering their expanded pig iron requirements and with a number of blast furnaces scheduled to go down for repairs the situation promises to get worse. The shortage of scrap is intensifying production difficulties.

PRICES STRONG—Current price situation is featured by a $4 per ton advance in pig iron at Swedeland, Pa., a $5 per ton boost on plates at Claymont, Del., and an advance in tin plate for export, effective Jan. 1. At the same time, a reduction in tungsten ore has been effected, reflecting virtual withdrawal of European buyers from the world market and the cut in U. S. import duties which becomes effective Jan. 1. For the most part no industry-wide change in base prices on finished steel products is immediately ahead, though the continued rise in production costs and threat of another round of wage increases places stability of the market in jeopardy.

SCRAP STALEMATE—While relatively little new business is reported in scrap, prices are strong at established levels, though untested. Brokers report difficulty picking up tonnage at prices which the steel mills will pay. Meanwhile, mill reserves are none too comfortable and increasing dependence is being placed on direct shipments from customers. Because of these direct shipments tonnage available to brokers and dealers is becoming increasingly scarce and in turn the foundries are hard put to cover needs. This situation is reflected in advances of $3 to $4 per ton on foundry grades.

OPERATIONS—Steelmaking held unchanged last week at 97.5 per cent of capacity. Due to fractional gains, the schedule last week was the highest since the final week of April, 1944, when the rate was 100 per cent. This week most mills plan to close their open hearth departments for 24 to 36 hours over Christmas.

PRICE COMPOSITES—Due to a slight easing in prices of steelmaking grades of scrap in the East, STEEL's composite price average on that material declined to $39.92 from $40.25 the previous week. Other composites held at $76.09 for finished steel, $57.20 for semifinished steel, and $36.31 for steelmaking pig iron.



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Dec. 20	Change	Same Week 1946	Same Week 1945
Pittsburgh	103	+ 1	92	78.5
Chicago	94	— 1.5	86	84.5
Eastern Pa.	93.5	None	77	78
Youngstown	91	None	67	75
Wheeling	93.5	None	85	95
Cleveland	91	— 0.5	91.5	86.5
Buffalo	88.5	None	88.5	46.5
Birmingham	102	None	84	95
New England	85	None	90	83
Cincinnati	89	+ 4	85	67
St. Louis	89.5	— 6.5	68	68
Detroit	92	None	93	84
Estimated national rate	97.5	None	85	80.5

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

News Summary—P. 33 *Engineering News—P. 61*

COMPOSITE MARKET AVERAGES

	Dec. 20	Dec. 13	Dec. 6	One Month Ago Nov., 1947	Three Months Ago Sept., 1947	One Year Ago Dec., 1946	Five Years Ago Dec., 1942
Finished Steel	$76.09	$76.09	$76.09	$76.09	$75.41	$64.75	$56.73
Semifinished Steel	57.20	57.20	57.20	57.20	56.80	41.10	36.00
Steelmaking Pig Iron	36.31	36.31	36.31	36.38	36.14	29.10	23.00
Steelmaking Scrap	39.92	40.25	40.42	40.42	37.83	27.69	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, rails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Dec. 20, 1947	Nov., 1947	Sept., 1947	Dec., 1946
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.55c
Steel bars, del. Philadelphia	3.318	3.318	3.28	2.91
Steel bars, Chicago	2.90	2.90	2.90	2.55
Shapes, Pittsburgh	2.80	2.80	2.80	2.35
Shapes, del. Philadelphia	2.954	2.954	2.94	2.48
Shapes, Chicago	2.80	2.80	2.80	2.35
Plates, Pittsburgh	2.95	2.95	2.95	2.50
Plates, del. Philadelphia	3.17	3.17	3.15	2.558
Plates, Chicago	2.95	2.95	2.95	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.48
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.19
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.90	†3.675
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.481
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.219
Sheets, No. 10 galv., Gary	3.90	3.90	3.90	†3.675
Strip, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.462
Strip, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.162
Bright basic, bess. wire, Pittsburgh	3.675	3.675	3.675	3.05
Wire nails, Pittsburgh	4.625	4.625	4.25	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$38.00
Slabs, Pittsburgh, Chicago	47.50	47.50	47.50	39.00
Rerolling billets, Pittsburgh	47.50	47.50	47.50	39.00
Wire rod 7/32 to ¼-inch, Pitts.	3.05c	3.05c	2.925c	2.425c

‡ Base, No. 5 to 5/16-in.

Pig Iron

	Dec. 20, 1947	Nov., 1947	Sept., 1947	Dec., 1946
Bessemer, del. Pittsburgh (N.&S. sides)	$37.913	$37.83	$37.83	$31.77
Basic, Valley	36.00	36.00	36.00	29.50
Basic, eastern del. Philadelphia	38.84	38.84	38.72	31.93
No. 2 fdry., del. Pgh. (N.&S. sides).	37.41	37.413	37.33	31.27
No. 2 fdry., del. Philadelphia	39.34	39.34	39.22	32.43
No. 2 foundry, Chicago	36.00	36.00	36.00	30.00
No. 2 foundry, Valley	36.50	36.50	36.50	30.00
Southern No. 2, Birmingham	34.88	34.88	34.51	26.88
Southern, No. 2, del. Cincinnati	38.74	38.544	39.38	30.94
Malleable, Valley	36.50	36.50	36.50	30.00
Malleable, Chicago	36.50	36.50	36.50	30.00
Charcoal, low phos., fob Lyles, Tenn.	50.00	46.40	44.00	37.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.00	$40.00	$38.00	$28.50
Heavy melt. steel, No. 2, E. Pa.	41.00	42.50	36.75	27.38
Heavy melt. steel, No. 1, Chicago	38.75	38.75	38.75	27.19
Heavy melt. steel, No. 1, Valley	39.75	39.875	39.50	28.75
Heavy melt. steel, No. 1, Cleveland	39.25	39.625	38.25	28.50
Heavy melt. steel, No. 1, Buffalo	42.50	41.81	39.00	26.63
Rails for rerolling, Chicago	59.00	56.25	46.25	31.00
No. 1 cast, Chicago	55.50	49.00	43.50	36.88

Coke

Connellsville, beehive furnace	$12.25	$12.25	$12.00	$8.75
Connellsville, beehive foundry	14.50	14.50	14.50	9.50
Chicago, oven foundry, del.	18.60	18.60	18.50	15.29

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $80-$85. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $55-$58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60; sales in open market $66 to $92.

Skelp: Pittsburgh, Youngstown, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-$70.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ½-in., inclusive, $2.80-3.30 per 100 lb. 5/16 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.52.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.351c; Phila., del., 3.318c; San Francisco (base, del.), 3.63-3.95c; Los Angeles (base, del.), 3.625-3.86c; Seattle, 3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del.), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

†Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.02c; New York, del., 3.12c; Los Angeles (base, del.), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 4.001c; Philadelphia, del., 3.968c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.27c; Philadelphia, del., 4.17c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.), 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c.

Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c.

Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c.

Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c*; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.27c; Phila., del., 3.17c; Boston, del., 3.423c; St. Louis, del. 3.269c; San Francisco and Los Angeles, del., 3.67c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif. (Central Iron & Steel Co., Harrisburg, Pa., 4.45c, basing points.)

* At Claymont, Del., 3.30c base price applies on all grades lower than flange quality steel. Effective Dec. 22, all grades, 3.40c.

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c. Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.02c; Phila., del., 2.954c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.52c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer.....*$3.55-3.80
Spring (except Birmingham)....**$4.25-**4.50

Wire Products to Trade

Nails

Standard and cement-coated .....†$4.25-5.00
Galvanized .....‡$4.00-4.75
Staples, polished and galvanized.....$4.25-5.00

Wire, Merchant Quality

Annealed (6 to 8 base) ..... §$4.20
Galvanized (6 to 8 base) ..... §$4.65

(Fob Pittsburgh, Chicago, Birmingham, per base column)

Woven fence, 15 gage and heavier....††91-101
Barbed wire, 80-rod spool ..... ††101
Barbless wire, twisted 101
Fence Posts (no clamps)..... ††90
Bale ties, single loop ..... ††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del.), $4.56, bright basic only.

** Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $5.33.

‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del.) $5.08.

§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66 galvanized.

†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 101; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	46	19½	1	56	41½
¼	47	25	1¼	56½	42
⅜	44	22	1½	57	42½
½	50½	34½	2	57½	43
¾	53½	38½	2½ & 3	58	43½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	49	34	48½	33½	48	33
2½-3	52	37	51½	36½	51	36
3½-6	54	39	53½	38½	53	38

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	45	1	55
¼	46	1¼	55½
⅜	43	1½	56
½	49½	2	56½
¾	52½	2½ & 3	57

In.	Lap Weld	Elec. Weld	Seamless
2	48	47½	47
2½ & 3	51	50½	50
3½-6	53	52½	52
8	53½	53	52½
10	53	52½	52
12	52	51½	51

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D.		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1″	13	....	$11.87	$11.51	$11.51
1¼″	13	....	14.06	11.48	13.64
1½″	13	$13.08	15.69	12.69	15.22
1¾″	13	14.88	17.85	14.43	17.31
2″	13	16.67	19.99	16.17	19.39
2¼″	13	18.58	22.29	18.02	21.62
2¼″	12	20.47	24.54	19.86	23.80
2½″	12	22.42	26.87	21.75	26.06
2¾″	12	23.76	28.48	23.05	27.63
3″	12	24.93	29.90	24.18	29.00
3¼″	11	29.03	34.81	28.16	33.77
3½″	11	31.17	37.39	30.23	36.27
4″	10	38.69	46.38	37.53	44.99
4½″	9	51.28	61.50	....	....
5″	9	59.39	71.18	....	....
6″	7	91.13	109.27	....	....

Pipe, Cast Iron: Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $86.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
7/16-in. and smaller	46 off	.....
½-in. and smaller	.....	44 off
½-in.-1-in.	44 off	.....
9/16-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws

(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off
Square Head Set Screws	
Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
7/16-in. and under	55 off
Lebanon, Pa.	55 off plus 15c per cwt.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50	51.00	40.50	51.00
310....	53.50	56.50	57.50	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403....	23.50	27.00	32.00	23.00	29.50
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442....	24.50	28.00	35.50	26.00	35.00
443....	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
*501...	9.00	13.00	17.50	13.00	18.50
*502...	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$37.00	$37.50	$38.00	$38.50
Newark, N. J., del.	39.02	39.52	40.02	40.52
Brooklyn, N. Y., del.	....	40.80	44.30	....
Philadelphia, del.	38.84	39.34	39.84	40.34
Birmingham, base	32.88*	33.38*	....	....
Baltimore, del.	....	40.42	....	....
Chicago, del.	....	36.72	....	....
Cincinnati, del.	....	38.74	....	....
Newark, N. J., del.	....	39.14	....	....
Philadelphia, del.	....	38.96	....	....
St. Louis, del.	....	37.77	....	....
Buffalo, base	36.00*	36.00*	36.50*	37.00
Boston, del.	43.128	43.128	46.63	44.13
Rochester, del.	38.02	38.02	38.52	39.02
Syracuse, del.	38.75	38.75	39.25	39.75
Canton, Massillon, O., base	35.50	36.00	36.50	....
Chicago, base	35.50	36.00	36.50	37.00
Milwaukee, del.	36.95	37.45	37.95	38.45
Muskegon, Mich., del.	....	40.21	40.71	....
Cleveland, fob furnace	35.50*	36.00*	36.50*	37.00
Akron, del.	37.34	37.84	38.34	38.84
Duluth, base	36.00	36.50	37.00	37.50
Erie, Pa., base	35.50	36.00	36.50	37.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	36.50	37.00	....	....
St. Louis, del.	37.33	37.83	....	....
†**Neville Island, Pa.,** base	36.00	36.50	36.50	37.00
Pittsburgh, del., N.&S. Sides	36.913	37.413	37.413	37.913
Provo, Utah, base	36.00	36.50	....	....
Seattle, Tacoma, Wash., del.	....	43.03	....	....
Portland, Oreg., del.	....	43.03	....	....
Sharpsville, Pa., base	36.00	36.50	36.50	37.00
Steelton, Pa., base	37.00	37.50	38.00	38.50
Struthers, O., base	36.50	37.00	37.00	37.50
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Troy, N. Y., fob furnace	39.50	....	40.00	....
Toledo, O., base	35.50	36.00	36.50	37.00
Cincinnati, del.	39.35	39.85	....	....
Youngstown, O., base	36.00	36.50	36.50	37.00
Mansfield, O., del.	39.28	39.78	39.78	40.28

† To Neville Island base add: 72.6c for McKees Rocks, Pa., $1.111 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; $1.463 Oakmont, Verona; $1.639 Brackenridge.

*Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Aug. 13; $4.00 higher for No. 2 foundry and malleable and $3.50 higher for basic at Buffalo, and $3.75 higher at Cleveland, effective on shipments during week ended Dec. 21.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$45.50
6.51-7.00..$46.75 9.01- 9.50. 53.00
7.01-7.50.. 48.00 9.51-10.00. 54.25
7.51-8.00.. 49.25 10.01-10.50. 55.50
8.01-8.50.. 50.50 10.51-11.00. 56.75
8.51-9.00.. 51.75 11.01-11.50. 58.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton. **Electric Furnace Silvery Pig Iron:** Si 14.01-14.50%, $70.75, Jackson, O.; $73.75, Niagara Falls; $73, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$50.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00. Philadelphia, $44.376, delivered. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace..	$12.00-$12.50
Connellsville, foundry..	14.00- 15.00
New River, foundry...	12.50
Wise county, foundry..	11.15
Wise county, furnace..	10.65

Oven Foundry Coke

Kearney, N. J., ovens.	$17.85
Chicago, outside del...	17.60
Chicago, del.	18.60
Terre Haute, del.	18.15
Milwaukee, ovens	18.25
New England, del.	19.60
Birmingham, del.	15.76
Indianapolis, ovens....	17.00
Cincinnati, del.	18.10
Ironton, O., ovens	16.00
Erie, Pa., del.	18.35
Painesville, O., ovens..	17.10
Cleveland, del.	18.50
Buffalo, del.	18.75
Detroit, del.	18.25
Philadelphia, ovens ...	16.90
Swedeland, Pa., ovens.	16.90
Portsmouth, O., ovens.	16.00
Fairmont, W. Va., ovens	16.25
Pittsburgh, del.	18.21

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	19.00†
Toluol, two degrees	23.00
Industrial xylol	25.00*
Solvent naphtha	25.00*

Per pound fob works

Phenol (car lots, returnable drums)	12.00§
Do., less than carlots	12.75§
Do., tank cars	11.00§

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "household use"	11.00*

Per ton, bulk, fob plants

Sulphate of ammonia	$35.00‡

* Effective Aug. 1. † Freight allowed up to 2 cents. ‡ Effective July 21. § Effective Oct. 1.

Refractories

Per 1000, fob shipping point

Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low-Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite....	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.55
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.20

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%.	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 65.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	28.50
50% no ratio	29.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo. cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30*	5.30*	5.30	...	...	...	...	...
Shapes, structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½"& up	H-R Alloy (8140)	Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city)	4.96	6.03[4]	5.73[4]	6.16[4]	7.41[4]	5.04	6.73	4.95	5.63	7.22	4.82	5.11	6.79
††New York (city)	4.91	6.12	5.82[3]	6.11	7.36	5.03	....	5.02	5.57	7.00[9]	4.75	5.06	6.76
New York (country)	4.76	5.97	5.67[3]	5.96	7.21	4.88	....	4.87	....	....	4.60	4.91	6.61
Philadelphia (city)	4.67	6.28	5.88	5.87	7.12	4.78	5.68	4.83	5.53	7.15[9]	4.55	4.82	6.31
Philadelphia (country)	4.57	6.18	5.78	....	....	4.68	5.58	4.73	....	....	4.45	4.72	6.21
Baltimore (city)	4.31†	5.91	5.61	5.71	6.96	4.76	....	4.81	5.51	....	4.68	4.76	6.26
Baltimore (country)	4.21†	5.81	5.51	5.50	6.75	4.66	....	4.71	....	....	4.58	4.66	6.16
Washington (city)	4.75	....	....	....	....	4.95	....	5.00	5.60[13]	....	4.90	4.95	6.60
Washington (country)	4.65	....	....	....	....	4.85	....	4.90	....	....	4.80	4.85	6.50
Norfolk, Va.	4.80	....	....	....	....	....	....	5.10	5.90	....	5.05	5.05	6.80
Memphis, Tenn. (city)	4.82[20]§§	5.87[20]†	....	6.37	....	5.02[20]	....	4.97[20]	5.87	....	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]§§	5.77[20]†	....	6.27	....	4.92[20]	....	4.87[20]	5.77	....	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	....	5.20[5]	6.00	....	4.70	5.65	4.40	5.10	6.65	4.40	4.95	6.20
Buffalo (country)	4.30	....	5.05[5]	5.55	....	4.25	5.50	4.25	4.95	6.65	4.25	4.45	5.75
Pittsburgh (city)	4.25§§	....	5.10[5]†	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10§§	....	4.95[5]†	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[5]	5.20[5]	5.78	7.03	4.52	5.35	4.40	5.10	6.85	4.65	4.60	6.15
Cleveland (country)	4.30	5.35[5]	5.05[5]	....	....	....	5.20	4.25	4.95	....	....	4.45	....
Cincinnati	4.671	5.516[5]	....	5.716	6.466	4.694	....	4.703	5.353	....	4.744	4.903	6.244
Detroit	4.55	....	5.30	....	....	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[5]	....	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[5]	5.20[5]	5.65	6.90	4.35	5.45	4.40	5.10	6.65[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[5]	5.05[5]	5.50	6.75	4.20	5.30	4.25	4.95	6.65[9]	4.25	4.45	5.90
Milwaukee	4.629	5.679[5]	5.379[5]	5.829	7.079	4.529	5.629	4.579	5.279	6.979[9]	4.579	4.779	6.229
St. Louis	4.78	5.83[9]	5.53[9]	6.02	7.27	4.68	5.82	4.73	5.47[12]	....	4.73	4.93	6.38
Birmingham (city)	4.45[20]§§	....	....	5.65	....	4.45[20]	....	4.40[20]	5.93[23]	....	4.40	4.65	6.86
Birmingham (country)	4.30[20]§§	....	....	5.50	....	4.30[20]	....	4.25[20]	....	....	4.25	4.50	....
New Orleans	4.98[20]**	....	6.29[18]	....	....	5.18[20]	....	5.13[20]**	6.29[11]	....	5.03[20]**	5.33[20]	7.29[20]
Omaha, Nebr.	5.365	....	....	6.565	7.815	5.265	....	5.315	6.015	....	5.315	5.515	6.965
Houston, Tex.	5.50	....	....	5.50	7.70	5.25	....	5.30	6.80[12]	7.70	5.85	5.35	6.50
Los Angeles (city)	5.75	7.75[5]	7.45[5]	7.40	8.80	6.05	8.70	5.50	7.35[23]	9.35[16]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[5]	7.30[5]	7.25	8.65	5.90	8.55	5.35	7.20[1]	9.20[16]	5.20	5.40	7.50
San Francisco	5.20[21]	6.65[5]	....	6.85[5]	7.75[5]	5.75[21]	8.70[15]	5.05[21]	7.00[12]	9.35	5.20[21]	5.30[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]§§	....	7.10[5]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	8.50[13]	5.25[17]	5.45[17]	7.55[17]
Portland, Oreg.	5.30[17]§§	....	7.10[5]‡	6.70	....	5.60[17]	....	5.45[17]	7.45[19]	....	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [13]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [23]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled; **add 0.40 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Electro Metallurgical Sales Corp. has revised prices upward on certain products, effective Dec. 6 on spot sales and Jan. 1 on contracts. Following spot prices for calcium, chromium, silicon and briquetted and certain miscellaneous alloys are nominal pending issuance of new price lists by leading sellers.)

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23c, ton lot 23.6c, less ton 24.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 19.1c per lb of contained Cr, c.l., packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.50% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 87c per lb of contained chromium, carload packed 88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.). Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.2c per lb of contained Si, carload packed 12.25c, ton lot 12.85c, less ton 13.45c; Central, add 0.3c for c.l. and 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.65c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade, analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si) Eastern Zone, contract, c.l., bulk 7.65c per lb of briquet, c.l. packed 8.25c, ton lot 8.65c, less ton 9.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (**Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. (**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c, freight allowed. Spot add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al) Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Congress To Act on Mining Subsidies in January

NEW YORK — Congress will take up the question of mining subsidies in January, J. A. Krug, secretary of the Interior, told the National Minerals Advisory Council last week. In addition to studying this problem, he said, the Council will have to explore the subject of strategic minerals stockpiling to discover why the program has not moved more rapidly and what may be done to augment strategic stockpiles without disrupting the domestic supply. For details on the organization of this Council, please turn to page 42.

Subsidy proposal, as well as minerals stockpiling, will be studied also by National Minerals Advisory Council

COPPER — Stocks of refined copper at refineries dropped 7885 tons in November to 66,622 tons. Deliveries to domestic consumers declined 6078 tons last month to 106,232 tons, reflecting in part the sharp drop in production at refineries. Production of crude copper by primary sources totaled 64,901 tons while secondary sources produced 6960 tons, making total November output 71,861 tons, or a decline of 4439 tons. Production of refined copper declined 10,752 tons to 97,525 tons.

The domestic market was featured by a continuation of unusually heavy inquiry for January shipments, exceeding the pace set last month which carried the total to well above 100,000 tons. Prices were firm at 21.50c, Connecticut Valley, for electrolytic.

LEAD—Demand for lead continues well in excess of available supplies and sellers are reducing allotments to customers below the latter's requests. Shipments by producers are averaging about two weeks behind schedule. Undertone of the market remains firm at 14.80c to 14.85c, St. Louis.

ZINC — Galvanizers and die casters are taking all of the prime western and special high grade zinc tonnages offered by sellers at firm prices on the basis of 10.50c, East St. Louis, for prime western. Relatively little metal is available for prompt export.

TIN — British Ministry of Supply has increased the price of tin to consumers in the United Kingdom 13 cents a pound to 91.00c for the 99 per cent to 99.75 per cent grades. Other grades have been advanced correspondingly. Interests in the market still look for an increase in prices here as soon as negotiations are completed between officials of Metals Reserve and Bolivian tin producers on a new purchase contract for 1948. The existing contract, under which the United States pays 76.00c a pound for Bolivian tin at South American ports, expires Dec. 31. The price is expected to be raised to a level between 88.00c and $1 a pound. The first contract, dated Nov. 4, 1940, called for delivery of the first 18,000 tons at 48.50c.

Stocks of pig tin held by the Office of Metals Reserve declined 767 tons in November to a net total of 20,542 tons.

ALUMINUM—Production of aluminum ingot at secondary smelters totaled 13,684 tons compared with 11,461 tons in July, according to the latest report issued by the Bureau of Mines. Shipments to consumers totaled 14,708 tons in August, resulting in a drop in stocks to 16,115 tons.

GOLD — Canadian government has submitted to Parliament a proposal to boost gold production by means of subsidy payments. The government would make a payment to each gold mine designed to assist it in defraying part of its cost of production.

ARSENIC — A leading producer of arsenic advanced the price of the white trioxide 1/4-cent a pound on Dec. 15 to 6.25c in barrels. Price of bulk arsenic trioxide in carload lots held unchanged at 5.50c a pound.

NONFERROUS METAL PRICES

Copper: Electrolytic, carloads 21.50c, delivered Conn.; Lake, 21.62½c del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c 1000-4999 lb; 1½c, 500-999 lb; 2c 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 18.50-19.00c; 88-10-2 (No. 215) 26.50-27.00c; 80-10-10 (No. 305) 22.50-23.00c; No. 1 yellow (No. 405) 14.50-15.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c,

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 15.50-16.00c; No. 12 foundry alloy (No. 2 grade) 15.25-15.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 15.25-16.00c; grade 2 (92-95%) 14.00-15.00c; grade 3 (90-92%) 13.50-14.50c; grade 4 (85-90%) 13.25-14.00c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c, fob Freeport, Tex.; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 to 4000 lb, 35.00-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $79-$81 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg) $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 74.62½c, per ounce.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

Copper and brass product prices are fob mill, with freight prepaid on 200 lb or more.

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills, carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 5000 lb, 93.50c; less than 200 lb, 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb, 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: To all consumers: in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb, 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb, 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ⅝c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A, B	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.25, No. 2 copper 17.25, light copper 16.25, composition red brass 14.00, auto radiators 10.75, heavy yellow brass 10.00, brass pipe 11.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.75, No. 2 copper 17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 15.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.50-17.00, No. 2 15.50-16.00, light copper 14.50, No. 1 composition red brass 12.00-12.50, No. 1 composition turnings 11.50, mixed brass turnings 8.00, new brass clippings nom. 12.00-12.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.00-6.50, heavy yellow brass 8.25-8.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.50-9.75, cocks and faucets 9.50-9.75, brass pipe 9.25-9.50.

Lead: Heavy 12.00, battery plates 6.75-7.00, linotype and stereotype 14.00-14.50, electrotype 11.50-12.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00-5.25; new die cast scrap 4.50-5.00, old die cast scrap 2.50-3.00.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S 8.50-9.00, old sheets 6.50-7.00, crankcases 6.50-7.00, borings and turnings 2.00-2.50, pistons, free of struts, 5.50-6.00.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Nov. Average	21.50	14.825	10.50	80.00	15.00	33.00	35.00	74.625
Dec. 1-18	21.50	14.80-14.85	10.50	80.00	15.00	33.00	35.00	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00
No. 2 Heavy Melt. Steel	40.00
No. 1 Busheling	40.00
Nos. 1, 2 and 3 Bundles	40.00
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	33.45-35.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	36.00-36.50
Bar Crops and Plate	45.50-45.00
Low Phos. Steel	44.50-45.00
Elec. Furnace Bundles	43.50-44.00
Heavy Turnings	39.50-40.50

Cast Iron Grades

No. 1 Cupola	52.50-53.50
Charging Box Cast	42.00-42.50
Heavy Breakable Cast	40.00-41.00
Unstripped Motor Blocks	45.00-46.00
Malleable	59.00-60.00
Brake Shoes	41.00-42.00
Clean Auto Cast	52.50-53.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00
R.R. Malleable	59.00-60.00
Axles	49.00-50.00
Rails, Rerolling	53.50-54.00
Rails, Random Lengths	50.50-51.00
Rails, 3 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Railroad Specialties	51.50-52.50
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-51.00

CLEVELAND

No. 1 Heavy Melt. Steel	$39.00-39.50*
No. 2 Heavy Melt. Steel	39.00-39.50*
No. 1 Busheling	39.00-39.50*
Nos. 1 & 2 Bundles	39.00-39.50*
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.00-35.00
Short Shovel Turnings	35.00-35.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	43.00-44.00
Punchings & Plate Scrap	43.00-44.00
Heavy Turnings	39.00-40.00
Alloy Free Turnings	37.00-38.00
Cut Structurals	52.00-54.00

* Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	58.00-62.00
Charging Box Cast	50.00-52.00
Stove Plate	52.00-54.00
Heavy Breakable Cast	52.00
Unstripped Motor Blocks	50.00-51.00
Malleable	67.00-70.00
Brake Shoes	50.00
Clean Auto Cast	58.00-60.00
No. 1 Wheels	54.00
Burnt Cast	50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00
R.R. Malleable	67.00-70.00
Rails, Rerolling	56.00
Rails, Random Lengths	54.00-55.00
Rails, 3 ft and under	57.00-60.00
Cast Steel	53.00-54.00
Railroad Specialties	53.00-55.00
Uncut Tires	54.00-55.00
Angles, Splice Bars	58.00-59.00

VALLEY

No. 1 Heavy Melt. Steel	39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Bundles	39.50-40.00*
Machine Shop Turnings	34.00-35.00
Short Shovel Turnings	35.00-35.50
Cast Iron Borings	34.50-35.00
Low Phos.	47.00-48.00

* Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-41.00*

*Earmarked for return to steel supplier. Price in open market, 48.00-49.00.

MANSFIELD

Machine Shop Turnings	36.50-37.50
Short Shovel Turnings	36.50-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
No. 1 Bundles	39.50
No. 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	52.00
Charging Box Cast	43.00
Heavy Breakable Cast	44.00
Stove Plate	43.00
Unstripped Motor Blocks	42.00
Brake Shoes	39.00
Clean Auto Cast	50.00
Drop Broken Cast	55.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	42.00
R.R. Malleable	58.00
Rails, Rerolling	50.00
Rails, Random Lengths	47.00
Rails, 18 in. and under	53.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50-35.00
No. 1 Busheling	34.50-35.00
Nos. 1 & 2 Bundles	34.50-35.00
No. 3 Bundles	34.50-35.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	29.50-30.00
Cast Iron Borings	29.50-30.00
Punchings & Plate Scrap	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	45.00-46.00
Heavy Breakable Cast	38.00-39.00
Clean Auto Cast	45.00-46.00

BUFFALO

No. 1 Heavy Melt. Steel	$41.50-43.50
No. 2 Heavy Melt. Steel	39.25-40.25
No. 1 Busheling	39.25-40.25
No. 1 & 2 Bundles	39.25-40.25
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Cast Iron Borings	34.00-34.50
Short Shovel Turnings	36.00-36.50
Low Phos.	45.00-47.00
Elec. Furnace Bundles	44.00-45.00

Cast Iron Grades

No. 1 Cupola	53.00-55.00
Heavy Breakable Cast	49.00-50.00
Malleable	56.00-58.00
No. 1 Wheels	50.00-52.00
Clean Auto Cast	52.00-53.00

Railroad Scrap

Rails, 3 ft. and under	50.00-52.00
Railroad Specialties	49.00-51.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	$41.00
No. 2 Heavy Melt. Steel	41.00
No. 1 Busheling	41.00
No. 1, No. 2 Bundles	41.00
No. 3 Bundles	39.00
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings	35.00-36.00
Bar Crop and Plate	47.50
Punchings & Plate Scrap	47.50
Cut Structurals	47.50
Elec. Furnace Bundles	44.50-45.50
Heavy Turnings	43.00-44.00
No. 1 Chemical Borings	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	50.00-51.00
No. 1 Machinery Cast	52.00-54.00
Charging Box Cast	50.00-51.00
Heavy Breakable Cast	50.00-51.00
Unstripped Motor Blocks	47.50-48.50
Malleable	65.00-70.00
Clean Auto Cast	52.00-54.00
No. 1 Wheels	54.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$33.50-35.00
No. 2 Heavy Melt. Steel	33.50-35.00
No. 1 Busheling	33.50-35.00
Nos. 1 & 2 Bundles	33.50-35.00
No. 3 Bundles	31.50-33.00
Machine Shop Turnings	27.50-28.50
Mixed Borings, Turnings	27.50-28.50
Short Shovel Turnings	29.00-30.00
Punchings & Plate Scrap	38.00-39.00
Cut Structurals	38.00-39.00
Elec. Furnace Bundles	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	46.00-47.00
Charging Box Cast	46.00-47.00
Heavy Breakable	45.00-46.00
Unstripped Motor Blocks	42.50-43.50
Malleable	54.00-55.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.50-32.50
No. 2 Heavy Melt. Steel	31.50-32.50
No. 1 Bundles	31.50-32.50
No. 1 Busheling	31.50-32.50
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	28.00-29.00
Short Shovel Turnings	28.50-29.50
Bar Crops and Plate	32.50-33.50
Punchings & Plate Scrap	32.50-33.50
Chemical Borings	28.00-29.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast	38.00-39.00
Stove Plate	38.00-39.00
Unstripped Motor Blocks	36.00-37.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	38.50-39.00
Nos. 1 & 2 Bundles	38.50-39.00
No. 3 Bundles	36.50-37.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	41.00-41.50
Punchings	49.00-50.00
Elec. Furnace Bundles	39.50-40.00
Heavy Turnings	38.00-38.50
Cut Structurals	43.50-44.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Clean Auto Cast	53.00-58.00
No. 1 Wheels	47.00-49.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	45.00-46.00
Malleable	69.00-70.00
Rails, Rerolling	58.00-60.00
Rails, Random Lengths	52.00-53.00
Rails, 3 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Railroad Specialties	53.00-54.00
Angles, Splice Bars	54.00-55.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$38.00-39.00
No. 2 Heavy Melt. Steel	37.00-38.00
Machine Shop Turnings	31.00-33.00
Short Shovel Turnings	33.00-34.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	47.00-50.00
Mixed Cast	45.00-47.00
Heavy Breakable Cast	40.00-41.00
Brake Shoes	46.00-47.00
Clean Auto Cast	48.00-49.00
Burnt Cast	45.00-46.00

Railroad Scrap

R.R. Malleable	60.00-62.00
Rails Rerolling	56.00-59.00
Rails, Random Lengths	50.00-52.00
Rails, 3 ft and under	54.00-55.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	48.00-49.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	51.00
Stove Plate	43.00
No. 1 Wheels	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00
Axles, Steel	39.00
Rails, Rerolling	52.00
Rails, Random Length	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

*Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$24.00
No. 2 Heavy Melt. Steel	24.00
No. 1 Busheling	24.00
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	22.00
Machine Shop Turnings	14.50
Mixed Borings, Turnings	14.50
Punchings & Plate Scrap	24.50
Cut Structurals	24.50

Cast Iron Grades

No. 1 Cupola Cast	30.00
Charging Box Cast	25.00
Heavy Breakable Cast	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melting	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	37.50-38.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

LOGEMANN

Presses for Sheet Scrap

THE NATION NEEDS YOUR SHEET SCRAP!

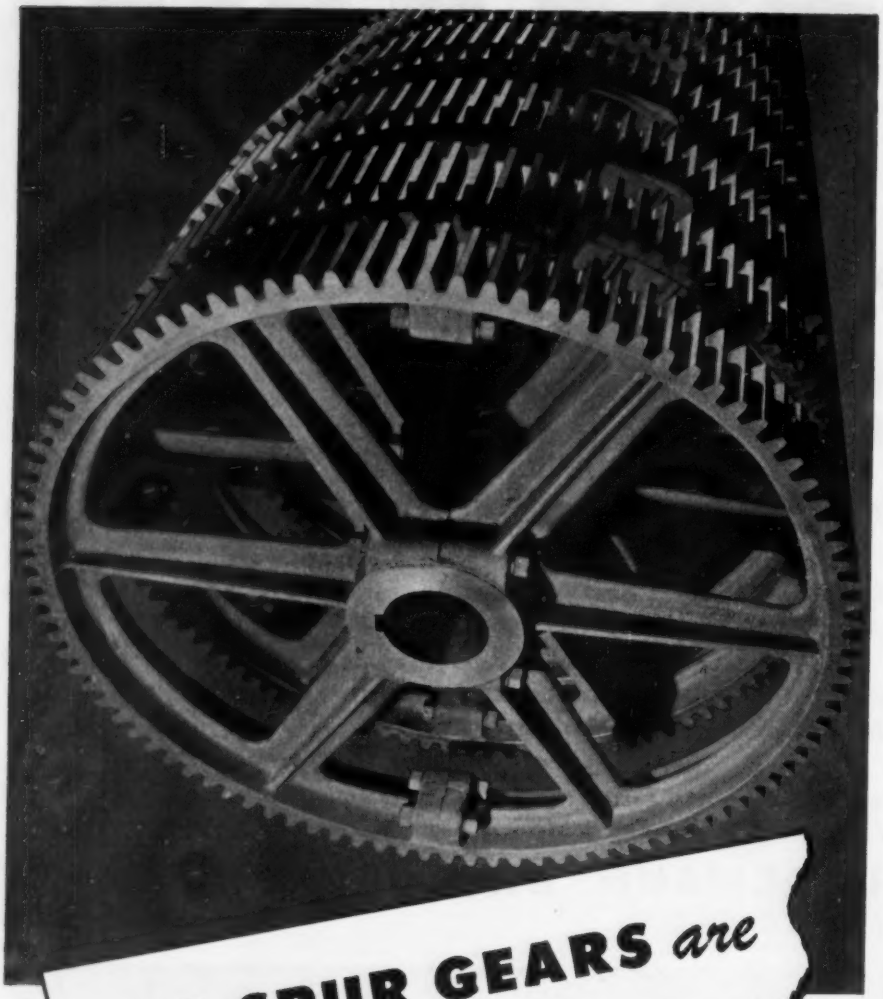
In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service,* presses *designed for automobile plant conditions,* presses *designed for general plant applications.* Write for details.

LOGEMANN BROTHERS COMPANY
3126 W. Burleigh St. **Milwaukee, Wisconsin**

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.



● Horsburgh & Scott spur gears are rugged and dependable, built for industry's hardest tasks . . . they stand supreme in quality of materials and workmanship. You'll find proof in their performance and long, uninterrupted service.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

Sheets, Strip . . .

Disruption in supply of silicon sheets feared. Scarcity extends to aluminum

Sheet Prices, Page 102

Cleveland—Silicon sheet supply likely will be disrupted by Studebaker Corp.'s move to purchase Empire Steel Corp., Mansfield, O., important producer of silicon sheets. A number of Empire's customers are seeking new supply sources, although Studebaker proposes to take care of its own needs with the least disturbance possible to Empire's present customers. Additional pressure for deliveries of carbon sheets and strip is noted by producers. Another indicator of this increased pressure is the report of a rise in gray market prices. Part of this pressure is attributed to the failure of mill production to meet schedules. Consumers are still offering trades of scrap in an effort to get on order books. Pressure for steel sheets is expected to increase on Aluminum Co. of America's announcement that it is temporarily ceasing to take orders for aluminum sheets. Some fabricators who have been substituting aluminum sheets for scarce steel sheets are expected to renew efforts to buy the latter.

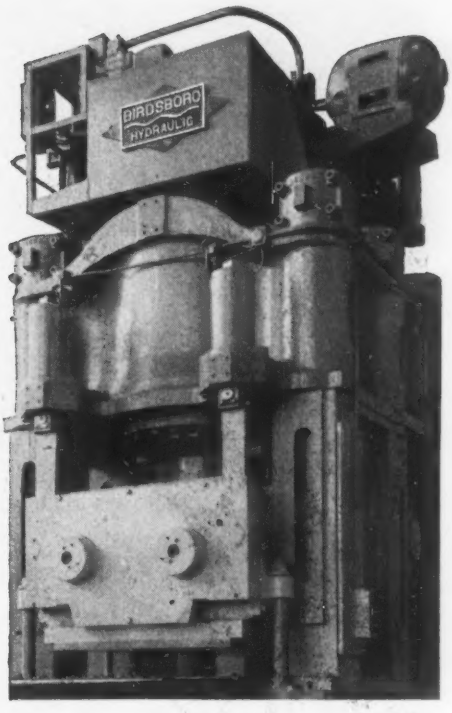
A monthly quota system which Republic Steel Corp. substituted recently for a quarterly method in distribution of carbon sheets and strip is expected to be extended, beginning with the second quarter of 1948, to all of the sheet and strip division's products. Because galvanized sheet output was sold out far in advance of production, Republic did not open its order books for this product for the fourth quarter of 1947 or the first quarter of 1948. Republic will open its March order books for carbon sheets and strip Jan. 1.

New York—District steel offices report fewer phone calls, due partly to holiday factors but this also implies not only less inquiry but less concern momentarily among consumers over shipments of tonnage already on order. Various district sheet metal working plants are planning to close down from the day before Christmas until the following Monday. In a few instances they are closing down until Jan. 2, due chiefly to a lack of steel.

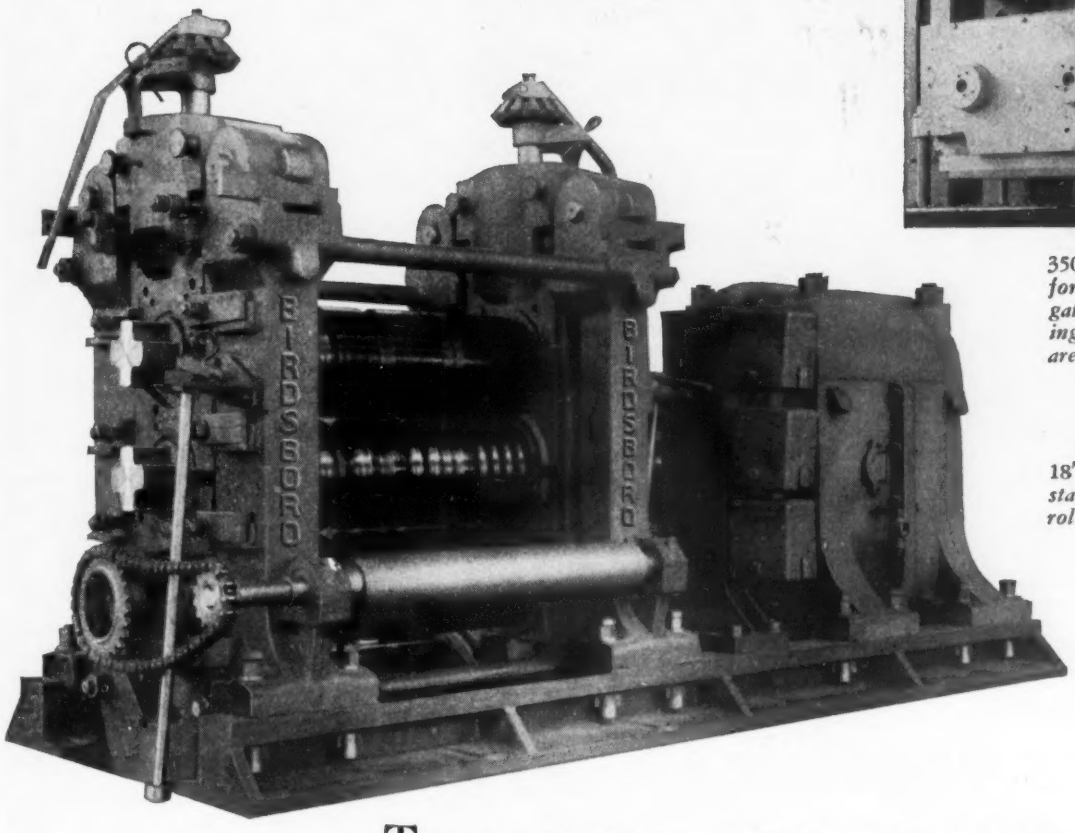
The new hot mill at Sparrows Point is beginning to roll, but on a restricted basis until the "bugs" are eliminated and a supply of steel can be developed. The 48-inch shape mill at Bethlehem, Pa., which is scheduled to go down for three or four weeks for repairs, will turn out sheet slabs for a while after it resumes operation for the new hot mill at Sparrows Point. Anticipated production at the new hot mill has been alloted for first quarter. Once this mill gets into full production, a new base likely will be established at Sparrows Point on cold-rolled sheets, for then a sufficient quantity of hot sheets will be available to boost production to a normal level at the new cold mill at that point.

Philadelphia — Supply of all major grades of sheets, including enameling stock, is falling short of requirements,

GIANT Birdsboro Machines built with BIRDSBORO STEEL CASTINGS



3500 ton asbestos board press for pressing flat and corrugated asbestos cement building boards up to 4′ x 12′ area.



18" 3-high roughing roll stand and pinion stand for rolling rounds and squares.

There are 340,000 lbs. of Birdsboro Steel Castings in these Birdsboro machines. These castings, made by the Randupson process (incorporating cement molds), are known throughout industry for their ability to withstand severe stresses, shock and impact—giving machines exceptional rigidity for long life performance under the toughest conditions of service.

Still larger castings are available—up to 50 tons—that conform closely to pattern, have clean surfaces, sharp contours and sound clear through. Our engineers will be glad to call and discuss your requirements. Put in a call today.

BIRDSBORO STEEL FOUNDRY & MACHINE CO. • BIRDSBORO, PA.

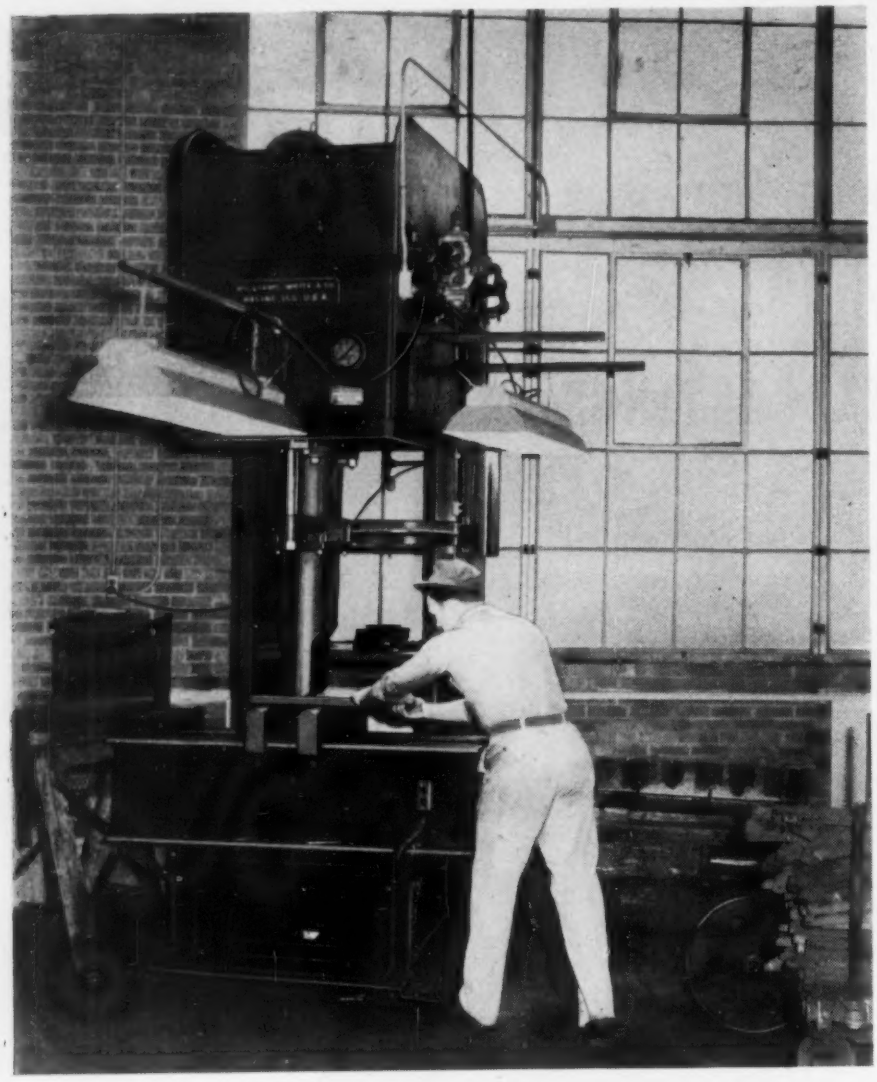
BIRDSBORO STEEL CASTINGS

Representatives in Chicago, Illinois • Pittsburgh, Pa.

BIRDSBORO
STEEL CASTINGS

Designers & Builders of:

STEEL CASTINGS • STEEL MILL EQUIPMENT • HYDRAULIC PRESSES • ROLLS • CRUSHING MACHINERY • SPECIAL MACHINERY



Straightening press built by WILLIAMS-WHITE & CO. for the John Deere Plow Works, Moline

WILLIAMS-WHITE Machinery Built to Your Specifications

All the accumulated experience of nearly 100 years of building the heavy production tools of industry goes into the manufacture of WILLIAMS-WHITE Presses, Shears, Hammers, Punches and Rolls. They are known throughout the world for their precision and highest quality materials and workmanship.

A staff of designers is at your service to aid you in planning machines to meet your specifications. Write us, telling in as much detail as possible your requirements and we will supply full information without obligation to you.

MAKERS OF PRECISION PRODUCTION MACHINERY FOR NEARLY 100 YEARS

WILLIAMS-WHITE & Co.

MOLINE, ILLINOIS

with prospects of an even more stringent situation in the first quarter. Little improvement is expected before the second half, with supplies continuing inadequate throughout the year. Any change to the contrary will come as a surprise to consumers. Even stainless is tightening up a little, with this trend due in part not only to increased requirements of utensil and household appliance manufacturers, but also to broadening application in the automotive field. However, deliveries can be had within six to eight weeks.

Chicago — Sheet and strip makers are proceeding cautiously in booking new business since they will have substantial carryovers at yearend. A strenuous effort is being made to get current on shipments by not later than Apr. 1. If that deadline is not met, some quota cuts may be in order. Consumers continue concerned over how they will be affected by the accelerated freight car building program next year and operation of the Marshall Plan. Farm implement makers may resort to use of aluminum sheet and strip material where they can do so due to the steel shortage.

Cincinnati — High sheet production has failed to cut into the carryover tonnage, precluding expanded allotments for the first quarter. Meanwhile, demand is undiminished.

Birmingham — Sheet demand remains considerably in excess of supply and no real easing in pressure is expected in the near future. Supply and demand balance is not anticipated at the earliest before late 1948, and not then unless demand tapers off while production edges upward.

St. Louis—Granite City Steel Co. began limited operation of its new $7 million cold reduction mill this week which is scheduled early next year to double output of cold rolled products. Calibration and tension tests are under way now. The company has released to its district offices allocations for February and March. Final plate production will be completed by Jan. 15, after which that capacity will be devoted to tin plate and light sheets. Approach of a new year is bringing new demand for sheets in this district. Some fabricators are appealing for tonnages up to 500 per cent more than 1947 deliveries. Appliance makers particularly complain they are having to curtail expansion plans heavily because of sheet shortages.

Tin Plate . . .

Tin Plate Prices, Page 103

Philadelphia — United States Steel Export Co. has increased tin mill product prices, effective Jan. 1. Quotations, including freight to New York, Philadelphia or Baltimore, which are subject to adjustment to sellers' prices at time of shipment from mill, are as follows on a net cash basis: Coke tin plate, 1.25-lb coating, 107 pounds, $7.76 per base box; 1.50-lb coating, $7.96.

Electrolytic process tin plate, unassorted, 0.25-lb coating, 107 pounds, $6.96; 0.50-lb coating, $7.16; and 0.75-lb coating, $7.36.

Special coated manufacturing ternes, unassorted, 107 pounds, $7.06.

Manufacturing ternes, unassorted, 107 pounds, $7.56.

Your scrap handling costs are eliminated when you use By-Products Steel Plate Shapes. No shipping charges to and from your plant on the metal that's trimmed from a gear blank like this, for example. No handling charges on all that weight within your plant.

These trimmings stay at By-Products plants, close to Lukens Steel Company, where they're hurried back to the open-hearth furnaces to help make more plate.

You have other savings, too! No need for expensive machines in your shop to do this pre-fabricating work; it's done to exacting tolerances at By-Products Steel. You get going quicker on finishing operations, so your production is speeded up.

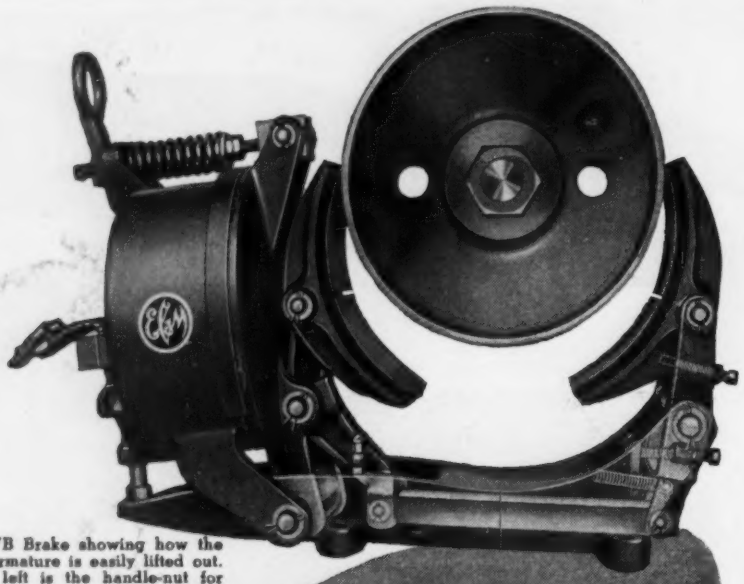
Our engineers will help you figure on using By-Products Steel Plate Shapes to start with. Write By-Products Steel Co., division of Lukens Steel Company, 414 Strode Avenue, Coatesville, Pennsylvania.

LUKENS
BY-PRODUCTS STEEL DIVISION

BY-PRODUCTS STEEL CO.

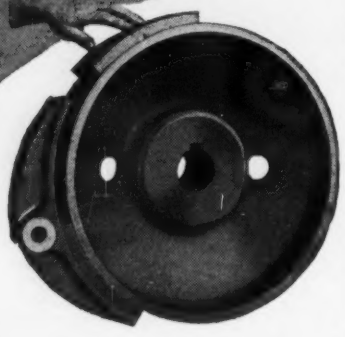
STEEL PLATE SHAPES

FLAME-CUT ★ SHEARED ★ PRESSED ★ BENT ★ BLANKED ★ WELDED



Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.

Long Life Brakes for A-C and D-C Motors by EC&M

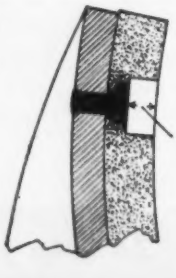


The brake lining is molded to match curvature of wheel and shoe.

These Type WB Brakes for a.c. and d.c. service have a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

EC&M Type WB Brakes are built in several sizes. They can be supplied with series or shunt-wound operating coils for direct current motors. On alternating current service, they are supplied in shunt-wound form for use with a compact rectifier-unit. Send for Bulletins 1004 and 1006 describing these long life brakes.



Actual wearing thickness, between rivet heads and brake wheel, is ⅛" on the smallest size to ½" on the largest size.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

Industrial Fuel Oil Prices Rise Further

Costs of steelmaking and other industrial operations utilizing residual fuel oils have risen further as result of another increase in fuel oil prices.

In the Cleveland area, the latest price boost, effective Dec. 9, approximated 1¼-c a gallon and followed the recent 50-cent-a-barrel increase in price paid for crude petroleum. One major supplier, which quoted No. 6 fuel oil at 9 3/4c before the increase, now quotes 11c. It is estimated the increase will raise steelmaking costs 45c a ton.

Steel Bars . . .

Bar Prices, Page 102

Pittsburgh—Barring unforeseen developments, most bar sellers expect to eliminate arrearages by Feb. 1. Some producers have cut customers' monthly allotments for the first quarter on the basis of a more realistic estimate of probable rolling mill schedules during the period. Revised monthly allotments take into account indicated carryover tonnages, blast furnace relining programs, poor quality coke, probable gas shortages and other similar factors. With exception of alloy spring steel flats, most alloy bars are available within four to six weeks. New orders for hot-rolled alloy and cold-finished alloy and carbon bars have increased recently.

New York—All suggestion of further easing in supply of hot carbon bars has disappeared. Very little can be purchased now for first quarter and only recently some producers reduced the amount of new steel alloted to the general trade under first quarter quotas. This is ascribed in part to heavier demands for the car program and to inability of some mills to meet fourth quarter shipment schedules. Some large producers expect to be fully caught up on arrearages by the end of January.

Cold-drawn carbon bar supply continues spotty. One large seller has the larger sizes available for shipment by February; small rounds and squares by April; small sized flats by August. Some cold drawers have small rounds and squares available for shipment in late February and early March; larger sizes, in late January and February. Small sized flats are the scarcest of all cold-rolled carbon items, but tonnage can still be had in the second quarter. Hot and cold-rolled bars are offered for shipment in five to six weeks.

Philadelphia — Hot carbon bar supply is tightening again. One large interest recently asked customers for permission to supply bessemer instead of open-hearth grades, if it were possible for the latter to utilize the bessemer grade. Most producers will have little or no more new tonnage to supply against first quarter quotas than at present, and some will not have as much. A relatively easy situation, however, still prevails in cold-drawn and alloy bars.

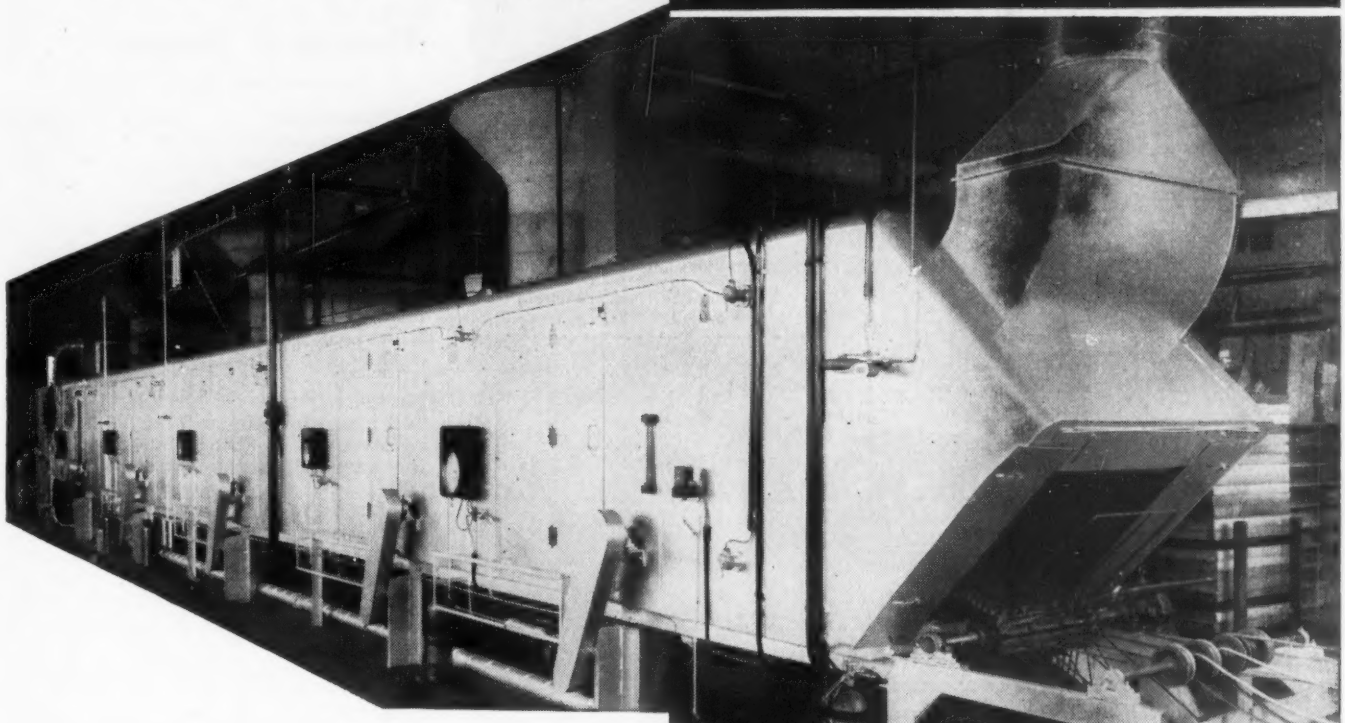
Chicago — Barmakers approach year end with much unshipped commitments on carbon bar, especially in the smaller sizes. Alloys are relatively free, although some pickup in

Important Improvements IN Metal Decorating Oven

The new Young Brothers metal lithographing oven is designed to take full advantage of rapid heat input and heat recuperation, rapid cooling and automatic unloading.

The following are some of its outstanding advantages:

1. Higher speed, and consequently more uniform heating of the work, reducing the overall length of the equipment required.
2. Greater fuel economy, utilizing recuperative cooling.
3. Extremely high degree of uniformity while the sheets are at operating temperature.



4. Minimum of heat losses to the building room since the sheets are cooled within a few degrees of room temperature before they leave the insulated section of the oven, and since the heat radiation surface of the oven is a minimum.
5. Minimum of adjustments necessary, simplifying the job for the operator.
6. Minimum floor space and ceiling height required.
7. Wide degree of flexibility, by simple control adjustments, for low or high temperatures.

ask **for an estimate on an installation to meet your specific requirements.**

Young Brothers Company

6503 MACK AVENUE • DETROIT 7, MICHIGAN

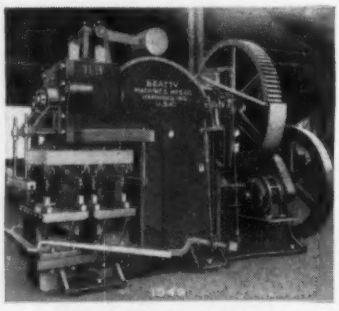
YB Co. ESTABLISHED IN 1898

YESTERDAY'S MACHINES

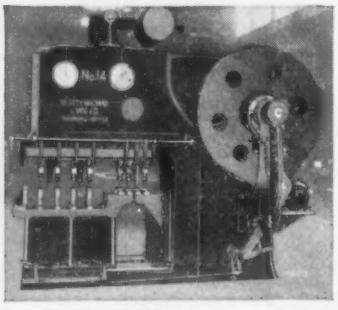
TOMORROW'S PROBLEMS

You can *win* or *lose* your battle of *sales* on *price!* *Obsolete* machinery means *high* production costs. But modern, *tailor-made* BEATTY-ENGINEERED machines can give you faster, higher-quality production at a *lower* cost. And you'll need that cost advantage in tomorrow's market. There's a better way to handle most production jobs. *Our* job is to help you find that *better* way. Call us in *now.* Our broad experience in metal working production qualifies us to handle the most difficult assignment.

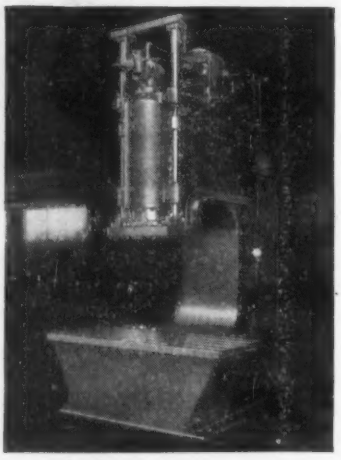
BEATTY Hydraulic Press Brake for V-bending, forming, pressing, flanging.



BEATTY Single End Punch available in capacities up to 350 tons. Ideal for car shops and jobs requiring multiple tooling.



BEATTY No. 14 Toggle Beam Punch for structural steel fabrication.



BEATTY 250-ton Gap Type Press for forming bending, flanging, pressing.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

demand is noted. Cold-drawn bars also are moving into a stronger position. A strenuous effort is being made to become current on deliveries within the next two months. One local barmaker is losing production each day through a slowdown of crane operators in its merchant products divisions.

Wire . . .

Wire Prices, Page 103

Birmingham — Wire output has gained slightly this quarter, but supply and demand situation has shown no appreciable improvement. No lasting betterment is expected until accumulated demand has been substantially met. Wire fencing demand is not as insistent as heretofore, but most other categories are still in the usual short supply.

Structural Shapes . . .

Structural Shape Prices, Page 103

Philadelphia — Structural shape buying was spotty last week, although several fair-sized projects are being figured. In general, shapes are scarce and fabricators have substantial order backlogs. New inquiry includes 1500 tons for two buildings for Seers, Roebuck & Co. Opening bids on foundation work for the Delaware Memorial bridge have been postponed from Dec. 17 to Jan. 6. This is the initial step by the Delaware State Highway Department, Wilmington, in obtainin steel for a project that will require in all 27,950 tons of structurals, 5275 tons of reinforcing bars, 4425 tons of wire, plus 54,000 lineal feet of suspension rope, 4000 tons of steel bearing piles and 6000 tons of castings, forgings and bolts, for an overall total of 51,650 tons, as noted in last week's issue. Howard, Needles, Tammen & Bergendoff, 55 Liberty St., New York, are the engineers.

Inquiries will be issued June 1, with bids closing Aug. 1, on 9400 tons of structurals for the main towers; July 1, with bids closing Sept. 1, on 600 tons of castings, forgings and bolts for anchor blocks; Sept. 1, with bids closing Nov. 1, on 1500 tons of reinforcing steel, 4000 tons of bearing piles and 250 tons of structurals for approach piers, also at that time on 4425 tons of wire for the main cables and the 2 3/8-inch suspension rope; Nov. 1, with bids closing Jan. 1, 1949, on 1250 tons of reinforcing bars and trusses and 5000 tons of silicon shapes and 12,500 tons of carbon shapes for the approach span superstructure; Feb. 15, 1949, with bids closing Apr. 15, on 7400 tons of carbon structurals and 1950 tons of silicon structurals for the suspended deck; and Nov. 1, 1949, with bids closing Jan. 1, 1950, for 800 tons of bars and trusses, for the roadway slab.

New York — Structural inquiry continues at possibly the highest level since the war. There is less public work than heretofore, but the decline is made up by expanding inquiry from private sources. The outlook is for a still more active market as spring approaches. Recent buying was featured by an order for 6100 tons for a

One of a series *of messages to help you increase your understanding of business paper advertising, and its effect on your business.*

How much longer can your company afford to "refuse business tactfully"?

LET'S FACE IT — the honeymoon is about over. It was fun while it lasted, but it won't pay the rent. Not now.

After an absence of seven years, the spectre of a buyers' market is once more rearing its head, and its expression plainly reads—"I'm going to be hard to get."

This doesn't scare anybody who hasn't forgotten *how to sell.* But there are quite a few of us in American business who could use a quick refresher course. (We've had a long "vacation.")

When it comes to production, our output is up almost 100 per cent. We've acquired a lot of new techniques on the assembly line, because it was obvious that if there were to be any profits left—after increased labor costs, high-priced materials, and taxes—we'd have to trim every last ounce of fat off the manufacturing cost per unit.

But now the time has come when we must apply the same philosophy to the *manufacture of a sale.* That means—*more mechanization!*

Confronted with a buyers' market, how much will it cost *your* company to produce one unit of sale? A prohibitive sum, if you're going to depend entirely on personal contact. You'd have to hire a tremendous force of salesmen to cover the field. Even then, much of their valuable time would be spent on "missionary work"—which is really a job for *mechanized selling.*

Mechanized selling is simply another name for consistent and aggressive advertising. Like the machine on the production line, it is a multiplier of men's efforts, for it enables them to produce (*and earn*) far more than they could alone.

And when it goes to work in the business press, it becomes the most efficient machine at your disposal for *manufacturing sales at a profit!*

Just how efficiently does business paper advertising work? If you'd like to see some examples, we'll be glad to send you a recent ABP folder on actual results. Also, if you'd like reprints of this advertisement (or the entire series) to show to others in your organization, you may have them for the asking.

STEEL

is one of the 129 members of The Associated Business Papers, whose chief purpose is to maintain the highest standards of editorial helpfulness—for the benefit of reader and advertiser alike.

veterans hospital in Newark, N. J. Shape supply is tightening due to shortage of steel and in part to suspension of one 48-inch mill for repairs in eastern Pennsylvania.

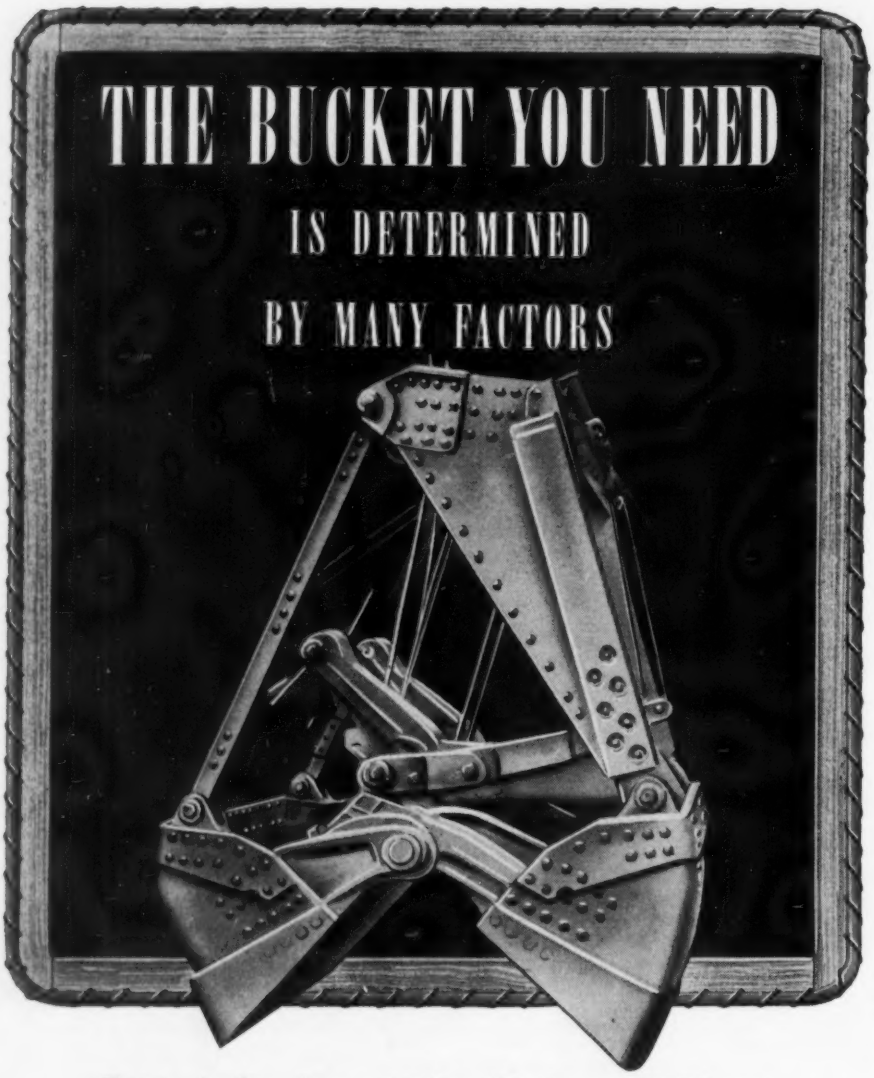
Plates . . .

Plate Prices, Page 103

Philadelphia — The Claymont, Del., producer has advanced plate prices to 3.40c, mill, effective Dec. 22. Previously this mill had been quoting 3.15c, with a base of 3.30c applying on all grades lower than flange quality steel. The new price, which is across the board, reflects higher costs, especially of raw materials.

New York — Heavy demand continues for tank and pipe work, and for the car program, with specifications exceeding supply. There is less public tank work, but private demand is strong. Most tank shops are operating below normal rates because of inability to get sufficient quantities of plate. Plate producers could go a long way in meeting demand if they were able to get an adequate amount of pig iron and scrap. Some plate mills are still unable to operate more than three or four days a week.

Birmingham—Plate supply remains tight and probably will tighten further if additional tonnage goes into the railroad program. Some plate users are keeping the wires busy in efforts to locate odd tonnages.



That is why Blaw-Knox maintains a list of over 100 different types and sizes.

Blaw-Knox Catalog 2002 contains sufficient information for you practically to "order by mail" exactly the clamshell you need for a particular bucket use.

Send for a copy of this informative catalog.

BLAW-KNOX DIVISION of **BLAW-KNOX COMPANY**
2015 FARMERS BANK BUILDING, PITTSBURGH 22, PA.

BLAW-KNOX BUCKETS

Tungsten Ore Prices Ease $4 a Ton as Supplies Gain

Philadelphia — Tungsten ore prices have eased $4 a ton to a range of $26 to $28 per short ton unit, duty paid. These prices reflect virtual withdrawal of European buying from world markets by virtue of lack of dollar exchange, making supplies freer, especially in South America. The decline in prices also reflects reduction in import duties from $7.92 to $6.03, effective Jan. 1. Domestic production has been maintained at the expanded rate for the last several months, but operations will be curtailed if the market continues to sag.

Pig Iron . . .

Pig Iron Prices, Page 104

Philadelphia — The Swedeland, Pa., pig iron producer has advanced prices $4 a ton, as of Dec. 16, to the basis of $45 for basic, $45.50 for No. 2 foundry, $46 for malleable, and $46.50 for bessemer. This increase is predicated solely on the increase in cost of replacement scrap since the former prices were established. Both furnaces at that point are now in operation, the larger having been blown in recently after several weeks' suspension for repairs. Pig iron supply was generally lighter this month than in November, although January shipments may be fairly well sustained.

Pittsburgh—All blast furnaces here, except one of Jones & Laughlin Steel Corp.'s units which is down for relining, are pouring iron. Output of most units is estimated at only about 90 per cent of rated capacity, due to poor quality coke and other production factors. Some interests are considering a downward revision in blast furnace capacities to more accurately reflect present operating conditions. Supply of merchant iron is estimated to be equivalent to only 60 per cent of stated requirements and has forced some foundries to shut down for brief periods. Most integrated steel producers are using a heavier pig iron charge, due to scrap scarcity, resulting in a reduction in supply of merchant iron available to foundries.

New York—Most foundry iron sellers are setting up their January quotas this week, now that the Dec. 20 deadline on iron for the housing program has passed. They felt compelled to wait even though the program is due to expire at the end of this month and the iron in question is scheduled for delivery afterward.

Chicago — Critical pig iron supply situation here has worsened and further blows are in the offing. From mid-September to Dec. 6 all furnaces were in blast, output being at the highest rate in history. On the latter date, Carnegie-Illinois Steel Corp. blew out No. 8 furnace at Gary for relining. On Dec. 16, Interlake Iron Corp. blew out its Federal B furnace at South Chicago for relining, indicating idleness for about 60 days. Inland Steel Co. plans to shut down its No. 6 stack at Indiana Harbor on Dec. 24 for relining, and Wisconsin Steel Co. has scheduled its No. 2

unit at South Chicago to go down Feb. 15 for the same reason. While these stacks are idle, iron supply for the foundry trade will be seriously curtailed and steel plants will be hard pressed to maintain operations. Quotas of southern iron to this district reportedly will be cut sharply in coming months.

Cincinnati — An American Rolling Mill Co. blast furnace has resumed production at Ashland, Ky., after relining.

Buffalo — A tense pig iron situation here is aggravated by lack of quality coke. While the expected shutdown of a merchant stack for repairs will reduce the available iron supply, it will have the effect also of temporarily increasing the coke supply for active furnaces. Nevertheless, a drastic curtailment in foundry operations looms. The producer is making every effort to keep the furnace operating as long as possible.

Seattle — Foundries report increased pig iron receipts, due in some measure to the desire of Utah producers to take care of regular customers. Co-operating with pig iron operators, foundries are using as little pig as possible and increasing the ratio of cast iron scrap. The latter is in better supply since the trade raised the price to $30, gross fob plant to dealers.

Scrap . . .

Scrap Prices, Page 108

New York — While some tonnage of major steelmaking grades is coming out at $33.50, fob shipping point, brokers are still paying higher prices in some instances for necessary tonnage. As a result, the brokers' market here is $33.50 to $35 for major steelmaking grades and $31 to $33 for No. 3 bundles. Machine shop turnings and mixed borings and turnings are off slightly at $27.50 to $28.50; punchings and plate scrap, cut structurals and electric furnace bundles, $38 to $39. No. 1 cupola and charging box grades are higher at $46 to $47; heavy breakable, $45 to $46. Malleable is nominally unchanged at $54 to $55, although exceptionally strong.

Philadelphia — While major steelmaking grades of scrap are off in price to around $41, delivered, there is relatively little business and the market undertone is fundamentally strong. Brokers are having difficulty picking up scrap for resale at the lower prices.

Two midwestern mills have been offering to buy melting steel out of Philadelphia at the equivalent of $38.50, Bethlehem, Pa., minus $2.46 freight from that point to Philadelphia, plus freight to their own plants, which would bring their delivered prices up to around $45. However, with brokers having to pay more at this point to cover commitments, trading appears out of the question. Meanwhile, one or two mills, which recently held up shipments against old contracts, are again taking in scrap.

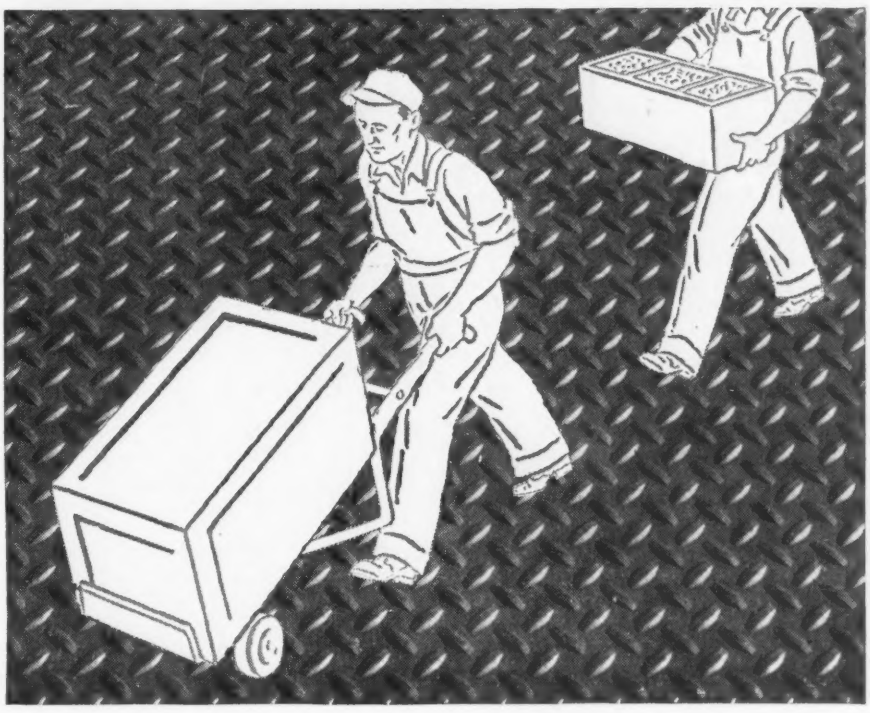
Cast scrap price tone is definitely strong with heavy breakable quoted $50 to $51, although a few hundred tons sold higher recently. Malleable is higher at $65 to $70, with some tonnage recently sold by the Reading railroad at the outside figure. No. 1 wheels are higher at $54, delivered.

Pittsburgh — Relatively small-lot tonnages of heavy melting steel continue to be purchased here at $40, delivered. Very little market activity is expected through the remainder of the year, since many yards are holding material due to tax considerations. Opinion is mixed on prospect of mills holding to recently established voluntary price ceilings at 100 per cent above OPA levels. One small mill in eastern Pennsylvania recently purchased some scrap at $3.50 above industry's established price ceiling in that area. However, this mill is a lone exception to an otherwise solid industry front to stabilize prices. As expected, the flow of scrap to mills has declined substantially since establishment of the $40 level and the cancellation of unshipped tonnage at termination of higher-priced orders. Weakness developed in prices for turnings and low phos scrap in line with industry's effort to stabilize these items in proper relationship with heavy melting steel. A strong market continues for cast iron grades, while the latest Pennsylvania railroad's scrap list award resulted in high prices bid for rails and specialty items.

Cleveland — Further squeeze on supply of scrap available to foundries by the steel mills' practice of requiring that scrap produced by their customers be returned to the mills is reflected in a $2 rise here last week on No. 1 cupola cast to $58-$60.

Various grades of railroad scrap

SPEED Feet or Wheels . . .



INLAND 4-WAY FLOOR PLATE

Men and trucks start faster, move faster, and stop quicker on this super-tough safety steel flooring. The angular projections resist slipping and skidding, and provide positive traction even when wet. Use Inland 4-Way Floor Plate for floors, steps, platforms, ramps, or catwalks in your plant, or on mobile or stationary equipment you manufacture. Furnished in three size patterns and many thicknesses. Inland Steel Co., 38 S. Dearborn St., Chicago 3, Illinois. Sales Offices: Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

Stocked by Leading Steel Distributors

Write For Booklet

INLAND STEEL

suitable for foundries are also showing an upward price trend. In response to heavy demand for railroad scrap some is now moving from remote areas into the Mahoning Valley. With foundry demand becoming more insistent and with supply inadequate, scrap dealers are upping their prices for unprepared railroad scrap. Dealers are offering $42.50 to $43.50 for unprepared railroad scrap to be made into foundry grades. Most of the open market scrap moving to open hearths is reported going to the small, independent mills who are ignoring the large mills' formula of offering double the former OPA schedule. Some of these small mills are paying $2 to $5 over the formula.

Buffalo — Zooming prices on cast items featured the scrap market last week while mills and dealers remained deadlocked on steelmaking grades. Despite the continued absence of tonnage sales, stronger tendencies underlay steelmaking grades as dealers reported limited sales to smaller consumers. No. 2 heavy melting sold at around $42 a ton, compared with the hold-the-line price of $39.25; No. 1 heavy melting at $45-45.50, compared with prevailing range of $41.50 to $43.50. There were indications here that the prolonged stalemate between top producers and dealers was creating a supply pinch in other centers. One mill was reported taking approximately 5000 tons off the ground to ship to a mill in another center.

Foundries staged a buying rush to get cast scrap after being notified by a merchant iron producer that a blast furnace would be shut down in the near future. Prices on No. 1 cupola skyrocketed $3 to $5 a ton to a range of $53 to $55. Dealers who had recently accepted cast orders at $50 were caught also.

Chicago — Little scrap is moving to steel mills at $39 a ton, delivered, for heavy melting steel. Result is some steelmakers are operating on a narrow supply while others are dipping into inventories to maintain steelmaking rates. No change is expected until after first of the year. Meanwhile, dealers are stocking up their yards and waiting for the test which will determine whether mills can hold the present price schedule. Railroad offerings continue to bring exceedingly high prices.

Cincinnati — Scrap is moving in reduced volume as all interests await a test of the market. Mills are offering $38.70, del. Cincinnati, without success on any major tonnages, excepting where the scrap is earmarked at industrial sources. The last reported sale was at $39.50. Foundry grades are being bought avidly, and at higher prices.

Birmingham—Activity in the scrap market has tapered off considerably and probably will remain relatively quiet until after the first of the year when a real test is expected on efforts of steel mills to set up a rigid price structure on the order of OPA. Heavy melting moves at varying prices, mostly in the $37 bracket.

Seattle — Steel scrap is holding its own in relation to rolling mill consumption. While it is impossible to materially increase inventories, scrap receipts are equal to consumption and are expected to increase as ship breaking plants improve operational technique. The Everett Shipbuilding & Drydock Co., Everett, Wash., has recently turned its facilities to shipbreaking and is adding to the tonnage coming from that source. The price is unchanged at $24 gross, fob plant, freight differentials applying to outside points.

Brosius AUTO FLOOR MANIPULATORS ARE EASILY OPERATED

The Brosius Auto Floor Manipulator shown above, charges and draws heating furnaces and manipulates the pieces under hammers or presses. Power is provided by a machine mounted gasoline engine driven generator and an oil pump. The machine is traveled over the floor by an electric motor, while all other operations, including steering, are accomplished through oil cylinders.

Also, machines are designed so that power is taken directly from the plant lines through a flexible cable and a rotating collector mounted on the machine.

No tracks or runways are required and the movement of the machine is not restricted to any definite path.

Built in capacities of from 2,000 to 20,000 pounds.

Write for Your Copy of Our NEW General Catalog

Edgar E. BROSIUS Company Inc.

Designers & Manufacturers of Special Equipment for Blast Furnaces & Steel Mills

SHARPSBURG, Pittsburgh (15) PENNSYLVANIA

Slowdown Curtails Output At Illinois Steel Plant

Carnegie-Illinois Steel Corp. is losing daily about 900 tons of merchant products in its West Mills division of the Gary, Ind., works, as a result of a slowdown of crane operators. This slowdown involves 120 operators and in November caused a production loss of 26,000 tons, consisting principally of carbon and alloy grade bars, hot rolled sheets and strip. Dissatisfaction over pay rates is the basis of the slowdown, which company and union efforts have failed to terminate.

Warehouse . . .

Warehouse Prices, Page 105

Philadelphia — District jobbers report a holiday letdown in orders which probably will pull the month's bookings down from November. About 40 per cent of manufacturing plants will be closed from Dec. 24 to Dec. 29 and about 20 per cent from Dec. 31 to Jan. 5. Reflecting the ac-

tivity with which the month started off, one leading distributor reported that during the first 11 days average sales on a tonnage basis were the highest of the year.

Cincinnati — Pressure from some customers for warehouse steel has increased, as fabricators seek scarce materials to complete jobs before yearend. However, some other customers are asking shipment holdups to lighten yearend inventories. Overall demand is far in excess of supplies.

Rails, Cars . . .

Track Material Prices, Page 103

New York — Demand for cars and locomotives continues brisk. Sellers anticipate another good month with a possibility that awards may exceed the 8169 cars placed in November. Much depends upon action on several sizable lists between now and the end of the year.

New York Central System placed orders last week for 111 new diesel-electric locomotives at a cost of about $21 million. This raises Central's postwar improvements program above the $225 million mark. The orders were placed by the Central and two affiliates, the Pittsburgh Lake Erie and the Indiana Harbor Belt, with the American Locomotive Co., Electro-Motive Division of General Motors Corp., and Fairbanks, Morse & Co. The orders are for 8 passenger, 17 freight, 15 transfer, 64 switch and 7 road switch locomotives. Deliveries are scheduled to start next summer and extend into 1949.

Among newer car lists pending are 2000 refrigerators for Pacific Fruit Express and one calling for 500 or 1000 twin-hopper cars for Reading railroad. Largest award to be reported recently involves 2850 for the Chicago, Burlington & Quincy, placed with its own shops.

Canada . . .

Toronto, Ont. — Heavy demand for steel in the Canadian markets is pushing mill deliveries farther behind. As a result of large government commitments, supply of steel for domestic consumers will be curtailed sharply in 1948. The more general steel product lines will be much tighter in 1948 than they were this year. While some enlargements to finishing mills are planned in Canada, it is not expected that these will have much direct effect on increasing general supply of steel as plans do not call for much increase in supply of raw steel for finishing units.

Books are filled for first quarter and few commitments are being taken beyond the end of March. Consumers' quotas for the first quarter likely will be cut and reductions may extend well beyond that period. At the same time there appears little prospect of much improvement in steel imports from the United States.

While sheet production has been increased somewhat, demand had advanced on a much broader scale, resulting in a serious shortage. Sheetmakers can see no hope of improvement in supply for the next six months. Following are mill prices, steel sheets, base: Hot rolled sheets, 3.40c per lb.; galvanized, 5.50c; vitreous enamel, 10 gage, 4.60c, and 20 gage, 5.05c.

Demand for steel plates has increased at a much higher rate than has production. Since output in Canada is barely sufficient to meet 50 per cent of domestic requirements, consumers are looking to the United States to assist in meeting demand. Much of the increase in plate demand is credited to the enlarged railroad rolling stock and shipbuilding programs, but other consumers also have been seeking larger tonnages.

Heavy bookings are reported on carbon steel bars, and the supply situation as a whole is tight. Carbon bar quotas for first quarter likely will hold unchanged. There is little or no open mill capacity to the end of March, but some barmakers are out of the market. Prevailing base prices on bars is 3.25c per pound.

Merchant pig iron sales are holding at about 9000 tons per week, which is absorbing practically all production of Canadian blast furnaces. Production is being maintained at slightly better than 74 per cent of total capacity. However, producers have been unable to stockpile. Most shipments range from 50 to 200 tons, and some of the smaller melters report difficulty in obtaining all the iron they require. Shortage of iron scrap for foundry use is largely responsible for the pig iron shortage. Canadian pig iron prices are as follows: Base grade, 2.25 silicon and under, $39.50; malleable, $40.00; basic, $39.50 delivered gross ton Toronto.

Shortage of scrap iron and steel is steadily becoming more acute, and

Install Them and Forget Them!
AMERICAN
RADIAL
Roller Bearings
AMERICAN RADIAL ROLLER BEARINGS are engineered to exacting standards that result in better performance and minimum maintenance.
Furnished in 5 styles, 6 S.A.E. series and 85 sizes. Special designs also available. Write.
AMERICAN
ROLLER BEARING CO.
420 Melwood Street
Pittsburgh, Pa.
Pacific Coast Office:
1718 S. Flower St., Los Angeles, Calif.

ThredKut *
INCREASED OUTPUT 4 to 1

. . . reports
JOHN L. MOROSINI
D. A. Stuart Oil Co.
Representative

"Prior to using THREDKUT,* this customer had tried several types of cutting oil in tapping 1½" dia. x 1" holes in very tough cast steel, with a maximum production of 50 tapped holes before sharpening was necessary. On switching to THREDKUT,* output immediately increased to 200 tapped holes between sharpenings. Here is another instance where THREDKUT* demonstrated its well-established reputation for licking a tough job."

John L. Morosini

ThredKut *

. . . Stuart's THREDKUT is a unique cutting oil carefully manufactured to insure the maximum benefits from controlled chemical activity. Its outstanding performance on really tough jobs has long been recognized and its flexibility proved through exceedingly widespread use. The many time-tested values built into THREDKUT are serving the leaders of the metal-working industry, increasing efficiency and reducing costs.

Ask to have a Stuart Service Engineer discuss your cutting fluid requirements. THREDKUT literature available on request.

STUART *service goes with every barrel*

WRITE FOR DETAILS

D. A. Stuart Oil Co.

2735½ SOUTH TROY STREET, CHICAGO 23, ILL.

it is doubtful that steel mills will be able to maintain high operating schedules throughout the winter unless importations of steelmaking scrap can be maintained.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 103

Pittsburgh — In the Dec. 8 issue, page 156, it was erroneously stated that: "There is a slight possibility one large interest may temporarily discontinue producing nuts and bolts and concentrate on output of pole line hardware." Further investigation of the possibility of such action has definitely proven the statement to be in error.

Fastener producers state operations remain below capacity due to continued scarcity of steel, and no significant improvement in steel supply is indicated through early months next year. Most sellers report little change in pattern of new orders, with volume closely matching current output. Deliveries of nuts and bolts in the smaller classifications are extended 6 to 8 months, while for large sizes relatively prompt shipments are available.

Oliver Iron & Steel Gives Service Awards

Oliver Iron & Steel Corp., Pittsburgh, presented 143 service emblems Dec. 17 and 18 to employees who have become associated with the company's Employees' Service Club by virtue of their having completed 10 years of service with the corporation. At the same time, 25 persons advanced into the 20-year group, seven into the 30-year and nine received the 40-year emblems.

Shortages in Metallics Pinching Foundries

(*Concluded from Page* 35)

scrap at present, they went on, and that is in the government agencies—particularly the War Assets Administration, the War and Navy Departments and the Maritime Commission.

Mr. Lane recommended the subcommittee use its influence to get a new law passed to make it mandatory for the government agencies concerned to adopt "fast" policies for placing scrap on the market. In many cases government officials are discouraged by existing laws or policies or by lack of clear-cut authority from taking necessary action. The law that is needed, Mr. Lane said, would free them of the restraints that now cause delays.

Volume Unknown—As to how much potential scrap is in the hands of the government, the scrap spokesmen said they had no means of knowing. They told the subcommittee, however, that the sale of WAA scrap is particularly helpful to the gray iron foundries for the reason that much of it is cast iron beds from obsolete and overage machine tools and other machinery. Maritime Commission scrap potential for 1948 was estimated at 500,000 tons.

Scrap from Europe — As to how much scrap can be brought in from abroad, more will be known following the investigation of Secretary Harriman's mission to Europe which, according to a White House announcement, is due to sail from New York Dec. 30.

A letter from Maj. Gen. C. D. Magruder, of the United States Army command in Germany, which was read into the record, estimated that approximately 275,000 long tons of ferrous scrap will become available this side of July 1, 1948, in the United States-occupied zone of Germany for shipment to the United States.

It was stated by George Meredith of the subcommittee's staff that our Army authorities in Germany have taken steps to insure shipment to the United States of the full 147,000 tons of steel scrap recently sold to the Canterbury Corp.

Exports Low — Report specially prepared for the subcommittee by the Commerce Department revealed 1947 pig iron exports as negligible in the aggregate.

Foundrymen who told the subcommittee about the curtailed operating schedules at their plants as a result of insufficient receipts of pig iron included Deems W. Hallman, manager, Hajoca Corp., Lansdale, Pa.; G. L. Harberger, general sales manager, Eastern Foundry Co., Boyertown, Pa.; F. M. Wilton, president, Susquehanna Casting Co., Inc., Wrightsville, Pa.; Charles Hamilton, president, Alabama Pipe Co., Anniston, Ala., and David L. Dean, Caloric Stove Corp., Topton, Pa., and Philadelphia.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6100 tons, Veterans Hospital, Newark, N. J., to Harris Structural Steel Co., New York.

1200 tons, expansion, International Harvester Co., West Pullman, Ill., to Gage Structural Steel Co., Chicago, for fabrication by Allied Structural Steel Cos.

500 tons, mill building, Continental Steel Corp., Kokomo, Ind.; to Indiana Bridge Co. Inc., Muncie, Ind.; bids Oct. 30.

440 tons, store building, Bond Clothes, Chicago, to American Bridge Co., Pittsburgh.

360 tons, building, Tetley Tea Co., Hackensack, N. J., to Oltmer Iron Works, Jersey City, N. J.

275 tons, addition, Abramson's department store, Flushing, Long Island, through George Hoffman & Sons, to Grand Iron Works, New York.

200 tons, laboratory, Sylvania Electric Products Co., Bayside, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, bridge, Cone, Iowa, for Chicago, Milwaukee, St. Paul & Pacific railroad, to American Bridge Co., Pittsburgh.

185 tons, storage house, Wadhams & May Co., East Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

185 tons, warehouse for S. C. Johnson, Long Island City, N. Y., through Kay Construction Co., to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, Bowery Savings Bank, 250 West 27th St., through William L. Crow, to Bethlehem Fabricators, Bethlehem, Pa.

167 tons, utility and storage building, Standard Oil Co. of Indiana, Whiting, Ind., to Joseph T. Ryerson & Son Inc., Chicago.

150 tons, telephone exchange, New Rochelle, N. Y., to Grand Iron Works, New York.

110 tons, office and warehouse, Chase Brass & Copper Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, warehouse, Franco Steel Corp., Hillside, N. J., through David O. Evans, to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Jane Addams school, Seattle, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2000 tons, power plant, Iowa State College, Ames, Iowa; bids Dec. 20.

1500 tons, two buildings, Sears, Roebuck & Co., one at Pittsburgh involving 1000 tons and one at Elizabeth, N. J., involving 500 tons.

315 tons, apartment building, Chicago.

300 tons, power plant, Downingtown Paper Co., Downingtown, Pa.

250 tons, new plant, Reuter Bros. Iron Works Inc., Chicago.

250 tons, First Congregational Church, Manhasset, Long Island, Wilcox & Erickson, New York, consulting engineers.

100 tons, plant in Nutley, N. J., for the Queens Ribbon & Carbon Co., Brooklyn, N. Y., pending.

45 tons, state bridge, Camden county, New Jersey; bids postponed until Dec. 30.

Unstated, steel and concrete bridges, Montana state highways, awarded as follows: Prairie county, to W. P. Roscoe Co., Helena, $144,760; Jefferson county, to Hansen & Arr, Spokane, Wash., $123,400; Fergus county, Dudley Construction Co., Great Falls, $54,705.

Unstated, emergency bulkhead Grand Coulee dam; bids to Denver Jan. 6.

Unstated, relocation project Puyallup river, Washington; bids to U. S. engineer, Jan. 7.

Several hundred tons, chemistry laboratory, Rutgers University, New Brunswick, N. J.; bids to be closed by the state of New Jersey, Trenton, Feb. 16.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1192 tons, water softening plant, Des Moines, Iowa, for city, to Truscon Steel Co., Youngstown, O.; A. H. Neumann & Bro., Des Moines, contractor.

600 tons, building, Jensen Printing Co., Minneapolis, to United States Steel Supply Co., St. Paul; James Leck Co., Minneapolis, contractor.

500 tons, St. Regis paper bag plant, Tacoma, to Bethlehem Pacific Coast Steel Corp., Seattle; H. S. Wright, general contractor.

400 tons, grain elevator, Swift & Co., Champaign, Ill., to Inland Steel Co., Chicago; John S. Metcalf Co., Chicago, contractor.

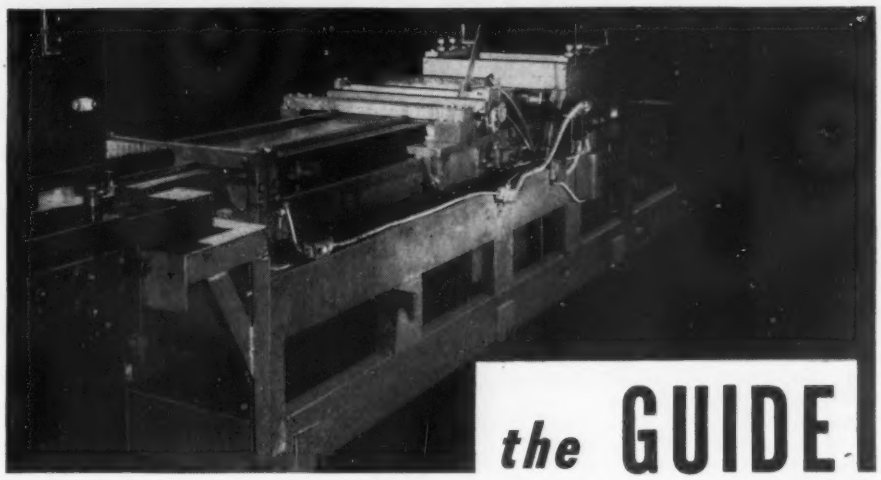
271 tons, Natural Resources building, University of Illinois, Urbana, Ill., to Truscon Steel Co., Youngstown, O.; Kuehne-Simmons Co., Rantoul, Ill., contractor.

200 tons, Washington state highway work Kittitas and Clallam counties, to Bethlehem Pacific Coast Steel Corp., Seattle.

130 tons, nurses home, Lutheran hospital, Ft. Wayne, Ind., to Bethlehem Steel Co., Bethlehem, Pa.; Midstates Construction Co., Ft. Wayne, Ind., contractor.

110 tons, Washington state game department building, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Aurora Const. Co.

100 tons, Great Northern Ry. warehouse, Se-



the GUIDE

COIL FEED MACHINE

WITH OR WITHOUT CUT-OFF

Variable delivery speed to meet any production demand. Accommodates any width that a steel mill can roll. Can be adapted to any material and product specified. Increases production

★

Specialists in the design and mfg. of equipment to handle coil strip. They also consider particular mfg. problems. Inquiries receive prompt and courteous attention

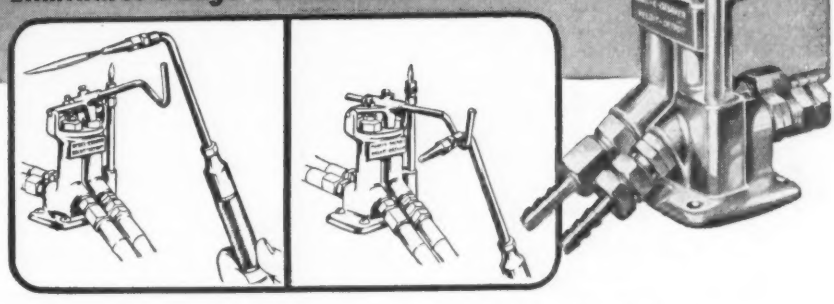
GUIDE CO.

CANFIELD, OHIO

WELDIT GASAVER

● Cuts Gas and Oxygen Cost!

● Eliminates Dangerous Fire Hazard!



With Weldit Gasaver installed the operator simply hangs his torch on the handy lever rod of the Gasaver. The weight of the torch pulls the lever rod down, closing the valves of the Gasaver, thus shutting off both gas and oxygen intake lines. The usual idle flame and needless waste of oxygen and gas between operations is thus eliminated—no fire hazard or danger of injury to workers.

When the torch is again picked up for further welding operations, the operator passes it across the pilot light of the Gasaver, thereby instantly igniting the torch at the preadjusted flame, ready for work—no adjustments to make.

Gasaver can be installed any convenient place on the line between regulators and torch. Most of America's largest production plants are now Gasaver equipped.

Listed as standard by Underwriters' Laboratories and by New York City Board of Standards and Appeals.

Some distributor territory still available.

996 OAKMAN BLVD. Weldit INC. SINCE 1918 DETROIT 6, MICH.

attle, to Bethlehem Pacific Coast Steel Corp., Seattle; Atherton Construction Co., general contract.

REINFORCING BARS PENDING

800 tons, addition, Florsheim Shoe Co. Inc., Chicago; Campbell-Lowrie-Lautermilch Corp., Chicago, contractor.

500 tons, board plant, United States Gypsum Co., Alta Vista, Va.

200 tons, negro housing development, Chicago; Patrick Warren Construction Co., Chicago, contractor.

437 tons, power plant and tunnels, Springfield, Ill., for state; bids Dec. 16.

150 tons, store building, Bond Clothes, Chicago; bids Dec. 30.

146 tons, Healthwin Hospital, St. Joseph County, Ind.; bids Dec. 16.

118 tons, addition, St. Constantine church, Chicago; bids Dec. 13 over estimate.

PLATES . . .

PLATES PLACED

1000 tons or more, 12 all welded steel vessels for fishing, lightering and other operations North Pacific coast; construction at various yards near Seattle.

550 tons, workbarge for Grand Coulee; assembly to American Bridge Co., low $78,000; materials furnished by Bureau of Reclamation.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago, Burlington & Quincy, 21 diesel-electric locomotives to the Electro-Motive Division, General Motors Corp., La Grange, Ill.; list includes fifteen 6000-horsepower and one 4500-horsepower freight locomotive, and four 2000-horsepower and one 4000-horsepower passenger locomotives.

Detroit Toledo & Ironton, seven 1000-horsepower diesel-electric switch engines, to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

Indian State Railways, thirty-three 2-8-2 type locomotives to Baldwin Locomotive Works, Eddystone, Pa.

New York Central System, 111 diesel-electric locomotives, placed with American Locomotive Co., Electro-Motive Division of General Motors Corp., and Fairbanks, Morse & Co. Orders placed by Central, Pittsburgh & Lake Erie and Indiana Harbor Belt include 8 passenger, 17 freight, 15 transfer, 64 switch and 7 road switch locomotives.

Peoria & Pekin Union, two 1000-horsepower diesel-electric switch engines, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Chicago, Burlington & Quincy, 2850, to own shops; list comprises 1100 fifty-ton box cars, 500 seventy-ton hopper cars, 500 forty-ton stock cars, 300 fifty-ton flat cars, 250 seventy-ton ballast cars, and 200 seventy-ton tank cars.

Denver & Rio Grande Western, 500 fifty-ton and 50 seventy-ton gondolas to Pressed Steel Car Co., and 100 forty-ton stock cars, to its own shops in Burnham, Colo.

New York, Chicago & St. Louis, 400 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Missouri Pacific, 1000 fifty-ton gondolas, to its own shops.

Detroit, Toledo & Ironton, 100 fifty-ton box cars, and 100 seventy-ton hopper cars, to The American Car & Foundry Co., New York; 50 seventy-ton hopper cars, to the Greenville Steel Car Co., Greenville, Pa.; and 10 fifty-ton ballast cars to Magor Car Corp., New York.

Missouri-Illinois, 100 seventy-ton hopper cars, to the shops of the Missouri Pacific.

RAILROAD CARS PENDING

Pacific Fruit Express, 2000 forty-ton refrigerator cars, pending. Reading, 500 seventy-ton or 1000 fifty-ton twin hopper cars, bids asked.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

WOODROW, ARK.—Linde Air Products Co. will begin a $200,000 plant for the production of oxygen and acetylene near here.

CONNECTICUT

HAMDEN, CONN. — Mortimer Newman Co. Inc., 780 State St., New Haven, will build a $75,000 factory at Dixwell Ave. and Haig St. Architect is Jacob Weinstein, 100 Lawin Ave.

FLORIDA

DADE COUNTY, FLA.—Standard Oil Co. will build a $194,000 storage tank at 1000 NW 73rd St.

JACKSONVILLE, FLA.—Florida Agricultural Supply Co., c/o E. A. Poppell, architect, 2024 Denis Ave., has rejected bids of Nov. 16 for a plant. Low bid was about $734,000.

MIAMI, FLA.—H. H. Ramsey & Sons Inc., 71 N.W. 11 Terrace, will build a $157,000 plant. Plans are by A. H. Baxter and W. C. Gorman, 209 Terminal Bldg., Coral Gables.

ILLINOIS

CHICAGO—Chicago Malleable Castings Co., 1225 W. 120th St., recently suffered a fire in its plant with loss estimated at between $100,000 and $150,000.

CHICAGO—Chicago Coin Machine Co., 1725 W. Diversey St., plans to build a $160,000 factory. Architects are Dubin & Dubin, 127 N. Dearborn St.

IOWA

CEDAR RAPIDS, IOWA—Central Iowa Power Co-operative has awarded a $521,000 contract to Foster Wheeler Co. for furnishing and installing one steam generator and related equipment.

DAVENPORT, IOWA—Victor Animatograph Co., S. G. Rose, president, 807 Kahl Bldg., has awarded a contract to George A. Fuller Co., 597 Madison Ave., New York, for construction of a $1,500,000 plant to include a 1-story factory, 2-story office and other features.

MARYLAND

BALTIMORE—American Bitumuls Co., 1955 Chesapeake Ave., has awarded a contract to Victor A. Pyles, 527 Chesapeake Ave., for construction of a $100,000 pump house.

HAGERSTOWN, MD.—Fairchild Engine & Airplane Corp. has received an order from the U. S. Air Force for delivery of 37 aircraft which will be new versions of the Fairchild Packet and will be known as the C-119. Cost of the planes will be approximately $22 million.

MICHIGAN

DETROIT—Mechanical Handling Systems, 4601 Nancy Ave., plans to build a $175,000 factory. Plans are by Vogel & Fortney, 611-12 Park Ave. Bldg.

DETROIT—Burroughs Adding Machine Co., 6071 Second Ave., has awarded a contract to W. E. Wood Co., 4649 Humboldt Ave., for construction of a $100,000 boiler house.

MINNESOTA

MINNEAPOLIS—Western Electric Co., V. McLean, construction engineer, 900 Laurel Ave., has awarded a contract to C. F. Halin & Sons, 720 National Bldg., for construction of a $2 million warehouse.

ST. PAUL—Great Northern Railway, H. J. Seyton, chief engineer, 175 E. Fourth St., has awarded a $195,000 contract to M. E. Souther Construction Co., 952 Raymond Ave., for remodeling an engine house.

OHIO

BEREA, O.—Ohio Nut & Bolt Co., 600 Front St., has awarded a $70,000 contract to R. S. Ursprung Co., Hanna Annex, Cleveland, for the construction of factory additions.

CLEVELAND—Sherwin-Williams Co. has begun operation of a new $750,000 solvent extraction plant at Cuyahoga Ave. and W. Third St. Plant is part of a $6 million improvement program undertaken since the end of the war.

CLEVELAND—Perma Products Co., 7001 Morgan Ave., has awarded a $150,000 contract to Peck & Udell, 4500 Euclid Ave., for rebuilding a plant.

CLEVELAND—Otis Elevator Co. is replacing most of the elevator equipment in the Union Commerce Bldg., Ninth St. and Euclid Ave., at a cost of $650,000.

EUCLID, O.—Euclid Road Machinery Co., Chardon Rd., will build a $400,000 addition to its plant at 22800 St. Clair Ave.

LORAIN, O.—National Tube Co. has awarded a contract to F. H. McGraw & Co., Hartford, Conn., for the complete rehabilitation and relining of its No. 1 blast furnace here.

YOUNGSTOWN—Federal Machine & Welder Co. has received an $800,000 order from Lustron Corp., Columbus, for presses to stamp prefabricated house parts from enameled steel.

PENNSYLVANIA

BRISTOL, PA. — Seaboard Container Corp., 51st and Gray Ave., Philadelphia, has awarded a contract to McCloskey & Co., 1620 W. Thompson St., Philadelphia, for construction of a $750,000 plant.

ERIE, PA.—General Electric Realty Corp., River Rd., Schenectady, N. Y., plans a $400,000 project to include construction of one building and additions to 24 others.

TAMAQUA, PA.—Bundy Tubing Co., 8100 E. Jefferson St., Detroit, has awarded a $400,000 contract to Ralph Woelfel, Markle Bank Bldg., Hazleton, for construction of a plant, office and boiler house.

RHODE ISLAND

PAWTUCKET, R. I.—Newman Crosby Steel Corp., 10 Dean St., has awarded a contract to Central Engineering & Construction Co., 210 Main St., for erection of a $55,000 factory addition.

PROVIDENCE, R. I.—United Electric Railways Co., 24 Exchange St., will build a $125,000 body repair shop on Melrose St. Engineer is Charles A. Maguire & Associates, 1015 Turks Head Bldg.

TEXAS

DALLAS, TEX.—Western Electric Co., C. K. Lawson, manager, has plans in progress for construction of a 3-story office building and plant at 5331 Mockingbird Lane. Cost will be about $500,000.

HEARNE, TEX.—General American Transportation Co., 135 S. LaSalle St., Chicago, plans to build a $150,000 tank car manufacturing and repair plant here.

HOUSTON, TEX.—F. H. Maloney Co., 410 Bastrop St., has awarded a contract to Marxen & Son, 1921 Westheimer St., for construction of a $115,000 plant.

HOUSTON, TEX.—Gulf Oil Corp., Box 2100, will build a $225,000 laboratory at Kirby Dr. and Wroxton Rd. Engineer is George H. Lacey, c/o owner.

ODESSA, TEX.—Gulf Oil Corp. plans to build a $250,000 addition to its office building here. Architect is Preston M. Geren, Ft. Worth.

WASHINGTON

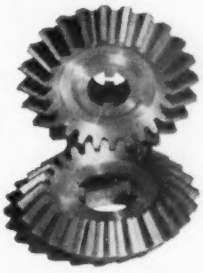
SPOKANE, WASH.—Inland Empire Refineries Inc., recently acquired by Phillips Petroleum Co., plans a $1,250,000 expansion program. Additional facilities will be installed to process Montana crude oil.

VANCOUVER, WASH. — Aluminum Co. of America, C. C. Thayer, local manager, has announced plans for a fabrication plant to use aluminum produced at the company's smelter here.

D.O.James GEARS For INDUSTRY

SINCE 1888 . . . We have been making many types and sizes of gears for industry. Vast plant facilities of the most modern gear cutting equipment assure capable handling of your *production* or *special* gear requirements.

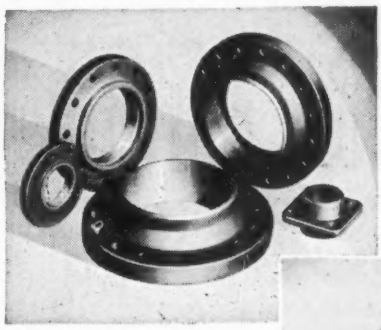
HELICAL and BEVEL GEARS—From 1" to 60" in diameter and from 24 DP to 1½ DP.
SPUR GEARS—Size range from ¾" to 150" in diameter. 32 DP to ¾ DP.
HERRINGBONE GEARS—Made from 1" to 60" in diameter and from 10 DP to 1½ DP.
SPIRAL BEVEL GEARS—Made from 1" to 30" in diam. and 24 DP to 1½ DP.
WORM GEARS — Made from 1" to 100" in diam. and from 24 DP to 1 DP.



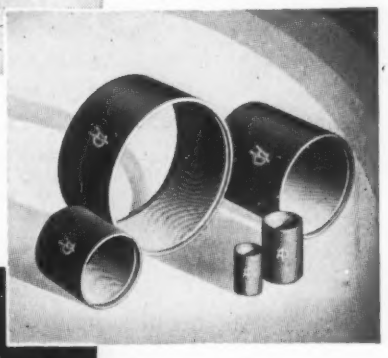
YOUR GEAR INQUIRIES WILL RECEIVE IMMEDIATE ATTENTION
D.O. JAMES GEAR MANUFACTURING COMPANY
1140 W. MONROE ST. • CHICAGO 7, ILL.

STEEL . . .
with the Seal of Quality

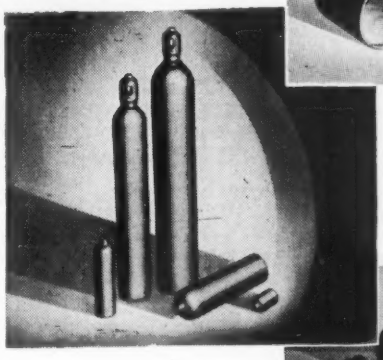
The science and "know-how" of Harrisburg craftsmanship begins with the steel . . . by selecting only the highest grade of quality steel. That is why Harrisburg enjoys a reputation for product superiority . . . wherever fine performance and durability are in demand.



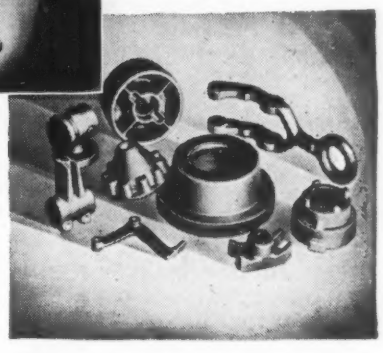
Harrisburg Drop-Forged Steel Pipe Flanges are made to A.S.A. standards and can be furnished in standard or special types to meet your exact requirements.



Harrisburg Seamless Steel Pipe Couplings are manufactured to A.P.I. specifications and are available in all sizes.



Harrisburg Seamless Steel Cylinders for high pressure gases. Available in standard or lightweight.



Harrisburg Drop and Hollow Forgings are available in all sizes, from the simplest to the most intricate designs.

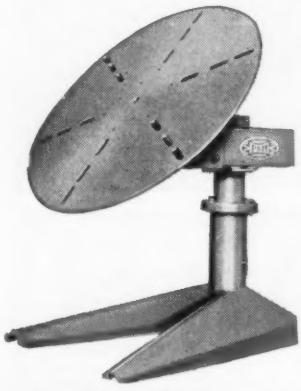
HARRISBURG MANUFACTURES: Alloy and Carbon Steels Seamless Steel CO_2 Liquefiers • Pipe Couplings and High Pressure Gas Cylinders • Drop and Hollow Forgings Forged Steel Pipe Flanges

HARRISBURG STEEL CORPORATION
HARRISBURG • PENNSYLVANIA

P&H WELDING POSITIONER

Position the Work Not the Operator

Cut Welding Costs 50%



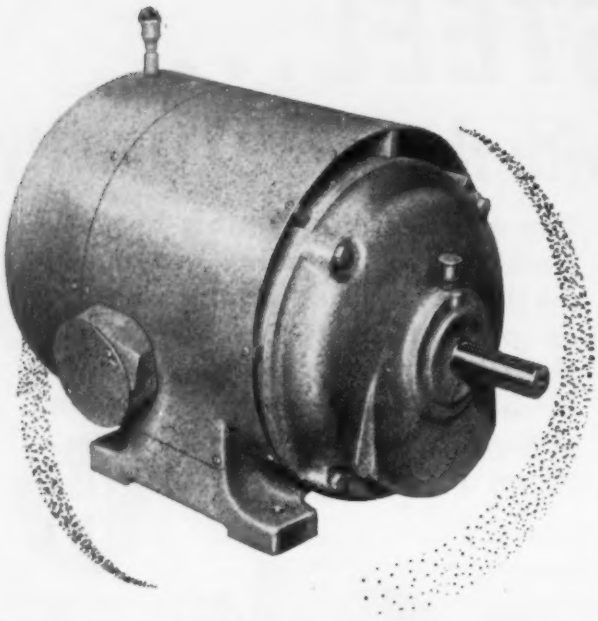
Actual comparison of positioned vs. unpositioned welding proves savings. Write for bulletin P2-1 of facts, figures and photos.

By quick, simple positioning of work for down-hand welding—P&H Positioners spare operators from awkward, uncomfortable positions . . . put an end to slow, costly out-of-position welding . . . permit the use of larger electrodes for faster deposition. They cut costs 50% for many users.

Features of WP-2 Positioner

- 2500 lbs. capacity
- Hydraulic power tilting
- 360° table rotation
- 135° table tilting
- Positive table locking device
- Telescopic elevation
- Manual turning to suit welding speeds
- Large table area with handy slots
- Portable or column-in-floor mounting

P&H HARNISCHFEGER CORPORATION
WELDING POSITIONER
4411 W. National Ave.,
Milwaukee 14, Wisconsin

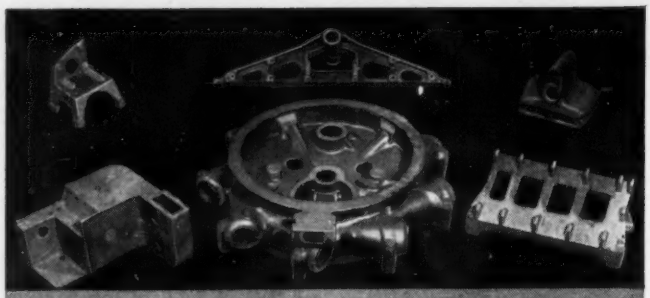


This Welco motor wears Goggles

Heavy dust and abrasive grit call for goggles and masks to protect the humans who work on them. The vital parts of an electric motor require protection too. This special Welco Torque Motor is enclosed and fan cooled. It can be used in heavy concentrations of dust, such as are often present in foundries, textile and chemical industries.

This is just one example of Welco special motor engineering. Wherever the power job or the conditions are tougher than ordinary, call on Welco. We go to work where standard motors leave off.

B. A. WESCHE ELECTRIC CO.
1628-30 VINE STREET CINCINNATI 10, OHIO



Magnesium Castings

Lighter • Stronger • Easier to Fabricate

Light weight Magnesium Castings are opening a wide new field in product design—and our engineering staff is at your service without obligation, to show you the possibilities of this stronger, easier-to-fabricate metal!

Facts you'll want to know about Magnesium Castings

Our new folder gives you the facts you'll want to know about Magnesium . . . and the story of our production facilities. You'll want this information at your fingertips!

Write for your copy today!

Utica Radiator Corporation
Manufacturers of Magnesium Castings for Industry
2200 Dwyer Avenue • Utica 2, New York

DIFFERENTIAL
STEEL CAR CO., FINDLAY, OHIO

Air Dump Cars, Mine Cars, Locomotives, Lorries AXLESS Trains and Complete Haulage Systems

Certified Steel Abrasives
FOR USE IN BLAST CLEANING EQUIPMENT
SAMSON STEEL SHOT
ANGULAR STEEL GRIT
PITTSBURGH CRUSHED STEEL CO., PITTSBURGH, PA.
STEEL SHOT & GRIT CO., BOSTON, MASS

BOOKS

On Metallurgy, Iron and Steel Practice, Foundry Work, etc.

We specialize in books of interest to our readers, and will be glad to advise you about the best book for your particular needs.

STEEL

Penton Building *Book Dept.* **Cleveland 13, Ohio**

IRWIN Hammerboards

MORE FORGINGS per HAMMERBOARD DOLLAR!

Grade "A" Hammerboards
"Weldrock" Hammerboards
Release Pins
Helves

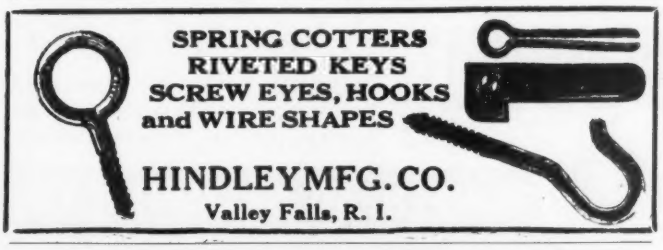
IRWIN
47 YEARS
of Quality

IRWIN MANUFACTURING COMPANY, INC.
Garland, Pa.

JOHN H. SIPCHEN CO. 549 Washington Blvd. Chicago, Illinois

CHARLEDGE SALES 335 Curtis Building Detroit, Michigan

BRETT'S PATENT LIFTER CO. Ltd. Foleshill Works Coventry, England



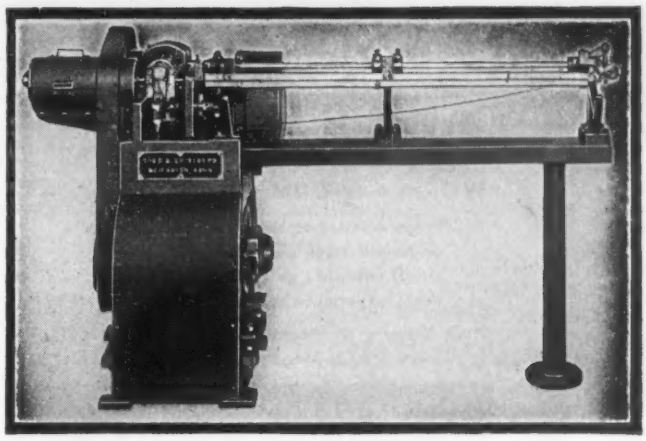
WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

TIN PLATE

COP-R-LOY PIPE-SHEETS

Ductillite
THE MODERN TIN PLATE

WHEELING STEEL



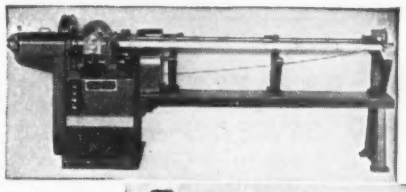
SHUSTER WIRE STRAIGHTENER TYPE A
Wire Capacity 1/32"—1/16" Diameter

Faster Cutting Speeds

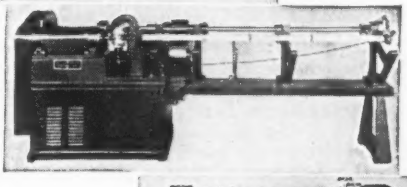
GREATER PRODUCTION!

Outstanding Features—
Almost continuous wire travel
Lightning cut-off assures square-cut ends
High speed, direct driven 5-die straightening flier
Quiet, highly efficient V-belt motor drive
Ball and roller bearings throughout
Extremely rigid construction
Fully guaranteed as to material and workmanship.

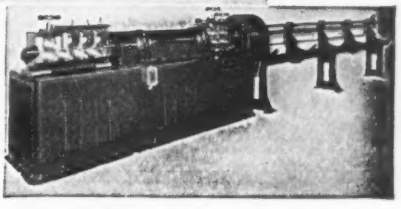
Descriptive folder on request.



Type 1A
1/16"—3/16"
Dia.



Type 2A
⅛"—¼"
Dia.



Type 3A
3/16"—⅜" Dia.
Type 4A (not shown)
⅜"—⅝" Dia.

The F. B. Shuster Mfg. Co., Inc.
3106 Mill River St., New Haven, Conn.

SHUSTER
Automatic
WIRE STRAIGHTENING
AND CUTTING
MACHINES
Since 1866

SIMONDS GEARS

SPUR • BEVEL • MITRE
WORM • WORM GEARS • RACKS

Large diameters! Heavy types—in cast or forged steel, gray iron, bronze, silent steel, rawhide or bakelite. Over 50 years' experience in quality gear making!

Stock Carrying Distributors of Ramsey Silent Chain Drives and Couplings • Emergency Service!

THE SIMONDS GEAR & MFG. CO.
Liberty at 25th • Pittsburgh 22, Pa.

PERFORATED METALS
TO YOUR REQUIREMENTS
FOR
ALL INDUSTRIAL USES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

Have It Galvanized by—
Joseph P. Cattie & Bros., Inc.
Gaul & Letterly Sts., Philadelphia, Pa.
Philadelphia's Oldest, The Country's Largest Hot Dip Job Galvanizer
Galvanized Products Furnished

HIGH SILICON IRON. "JISCO"
SILVERY
ESSENTIAL FOR ALL FERROUS METALLURGY
THE JACKSON IRON & STEEL CO. • JACKSON, OHIO

WIRE
ALUMINUM and Bronze Sizes: .007 and Larger
STEEL All Finishes
THE SENECA WIRE & MFG. CO., FOSTORIA, OHIO.

THE BELMONT IRON WORKS
STRUCTURAL STEEL—BUILDINGS & BRIDGES
RIVETED—ARC WELDED *Cable Address—Beliron*
Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

SAVE MONEY
ON PRESSED STEEL PARTS!

If you want to save money on pressed steel parts, call on Budd's wide experience in steel stampings of all kinds.

Like hundreds of manufacturers, you can take advantage of Budd "know-how" to lower production costs on blanks and stampings, in both regular grade and stainless steel. At your service Budd places the best-equipped machine shop—for both large and small dies—on the Atlantic seaboard.

Write today, sending a sample, blueprint or pencil sketch of your product, and let us quote you a price.

BUDD
THE BUDD COMPANY
Dept. 16 Philadelphia 32, Pa.

DEPENDABILITY
ACCURACY
ECONOMY

Since 1903, Whitehead has supplied American industry with stampings known for these qualities. Write for Catalog.

WHITEHEAD EST. 1903
WHITEHEAD STAMPING CO.
1667 W. LAFAYETTE BLVD., DETROIT 16, MICH.

TURN TO STEEL....

for help in locating scarce materials or machinery. The "Used & Rebuilt Equipment—Materials" section is the weekly meeting place for buyers and sellers of good used machinery and materials. Rates are moderate. For further information write today to STEEL, Penton Bldg., Cleveland 13, O.

USED and REBUILT EQUIPMENT
MATERIALS

WANTED

ONE ANNEALING OR HEAT TREATING FURNACE

2,000 degree capacity. Inside dimensions approximately 36" wide by 24" high by 48" deep.

Calumet Steel Castings Corp.
Hammond, Ind.

FOR SALE
2—Hydraulic Riveting Machines
Watson-Stillman 48" Throat,
1½" Daylight
Address Box 733,
STEEL, Penton Bldg., Cleveland 13, O.

ROLLING MILLS
and **EQUIPMENT**
FRANK B. FOSTER, INC.
2217 OLIVER BLDG. PITTSBURGH 22 PA.
Cable Address FOSTER Pittsburgh

WANTED
STEEL TUBING
AND PIPE
Give full particulars including price.
WALLACK BROTHERS
7400 So. Damen Ave., Chicago 36, Ill.
GROVEHILL 7474

Wanted
PLATE BENDING ROLLS
20 ft. pyramid type, drop end. Motor driven, state width and thickness of plates will roll.
Write Box 274,
STEEL, Penton Bldg., Cleveland 13, O.

Wanted
OPENSIDE PLANER
Late type 72" x 72" x 20' or 24' openside or convertible openside planer—not older than 1940. Variable voltage drive 3/60/220, 2 rail heads, 1 side head (will consider 1 rail head). Prefer Cincinnati Hypro or Grey.
The Aetna-Standard Engineering Company
Warren, Ohio

Wanted—SHEARINGS
Any Amount—All Sizes, Galvanized, Cold and Hot Rolled Aluminum—Stainless and Copper. 6" Minimum Width to 36" Minimum Length. Uniform Quantities. Gauges from 16 to 30 Inclusive.
Write or Wire
Los Angeles Sheet Metal Mfg. Co.
901-903 E. 9th St. Los Angeles 21, Calif.
TRinity 4713

NOW AVAILABLE...
HOT-DIP GALVANIZING PRACTICE

56 Illustrations
•
5 Tables
•
200 Pages
•
7 Charts
•
Especially noteworthy is the bibliography of articles on the subject of galvanizing.

By W. H. Spowers Jr. (*Second Edition*)

This revised edition gives carefully reasoned explanations of why and wherefore of galvanizing. All the latest methods and processes are described and very copiously illustrated. New subject matter dealing with "Typical Modern Galvanizing Plant Construction and Procedure" is included.

The author, W. H. Spowers Jr. is President, Spowers Research Laboratories, Inc., New York, and Commander attached Research Branch, Bureau of Ships, U. S. Navy.

Fills a great need throughout the metal-working industry as it is designed specifically for practical plant use. Valuable for reference in the library of every metallurgist, in all iron and steel-producing plants, and in technical schools and libraries everywhere.

ORDER YOUR COPY TODAY! . . . PRICE $6.00 POSTPAID

STEEL, *Book Department*
1213 W. Third St., Cleveland 13, Ohio

Date.....

Enclosed is $6 for which please send postpaid, one copy of Hot-Dip Galvanizing Practice, second edition, by W. H. Spowers Jr., just published.
*Orders for delivery in Ohio must be accompanied by an additional 3% to cover compulsory state sales tax.

NAME .....

ADDRESS .....

CITY..... STATE.....

USED and REBUILT EQUIPMENT
MATERIALS

OVERHEAD CRANES

1—7½ ton Morgan, 46' span cab operated, 230 V.D.C.

2—10 ton American Monorail 29' span, floor operated 3/60/220—with runway

1—150 ton Whiting, 30' span 3/60/440 V. A.C.

IRON & STEEL PRODUCTS, INC.
13462 S. Brainard Ave., Chicago 33, Ill.
"ANYTHING containing IRON or STEEL"

AIR COMPRESSORS

2—175' CFM Inger.-Rand 2 cyl. vert. 150 P.S.I. Type XIV, dir. con. to G.E. 50 HP DC motor, 230 V. 400 RPM. Mounted on factory cast iron base. Complete with intercooler, unloader and access.

2—1500 CFM Penna. 110 P.S.I. horiz. 2 stage, Class DCE-2, with direct motor drive 300 HP Elec. Mach. syn. motor, 3 ph. 60 cy. 2300 V. 225 RPM, with intercooler and aftercooler and access. Request Bulletin D-100 for other compr. in stock.

PHILADELPHIA TRANSFORMER CO.
Box 566 **Dalton, Pa.**

FOR SALE
6 ROLLER CONVEYORS

Each 9 feet long. Capacity 1 ton per lineal foot, 31" wide, 6" high. 4" rollers on 6" centers. Made by Palmer-Bee Co., excellent condition. $700.00.

DEFIANCE METAL WEATHERSTRIP CO.
Oak Harbor, Ohio

FOR SALE
CHEAP
FABRICATED COLUMN TOWERS

40' to 60' in length. Made up of 2 10" Channels boxed with latticed flats. Ideal for ball park floodlights, radio towers, power lines, or many other uses. A perfect substitute for building columns also. Sacrifice at 4c per pound.

Write, Wire, Call

GLAZER STEEL CORP.
Telephone 4-8601
2100 Ailor Ave. Knoxville, Tenn.

FOR SALE—SURPLUS STEEL

Solid Stainless			Stainless Clad		
Type 304—2-D Finish			No. 1 Pickle Finish 20% Clad		
Lbs.	Gauge	Size	Lbs.	Gauge	Size
24,000	19	33 x 62⅛	2,500	18	33½ x 97⅛
25,000	19	32½ x 85	10,000	20	30 x 63
8,000	18	36 x 120	45,000	18	32½ x 85
20,000	22	30 x 104½			
77,000			57,500		

STAR MANUFACTURING CO., INC.
6300 St. Louis Ave., St. Louis 20, Mo.
Telephone: Evergreen 8150

6 ton Capacity

HEROULT ELECTRIC FURNACE
Tilting Type

1, 6 ton shell,—1, 3 ton shell.
Complete with all electrical controls.

IRON & STEEL PRODUCTS, INC.
42 Years' Experience

General Office	New York Office
13462 S. Brainard Ave.	120 Liberty St.
Chicago 33, Ill.	New York 6, N. Y.
Phone: BAYport 3456	Phone BEekman 3-8230

"ANYTHING containing IRON or STEEL"

RAILS NEW AND RELAYING
TRACK ACCESSORIES
from **5** *Warehouses*

- PROMPT SHIPMENTS
- FABRICATING FACILITIES
- TRACKAGE SPECIALISTS

EVERYTHING FROM ONE SOURCE
L. B. FOSTER COMPANY
PITTSBURGH CHICAGO
NEW YORK SAN FRANCISCO

CORRUGATED ALUMINUM SHEETS
36 x 120 2½" corrugation
22-24-26 gauges

ALUMINUM ANGLES
1¼ x 1¼ x 3/32 x 11 ft.

COLD ROLLED WELDED TUBING
⅝" OD x 22 Ga. Wall
Mill Lengths

Harrison Sheet Steel Company
4718 W. 5th Ave., Chicago 44, Ill.

RAIL
STEEL PLATE
STRUCTURALS, PIPE,
TUBING, WIRE ROPE,
FERROUS AND NON-FERROUS SCRAP

BOUGHT-SOLD
LIQUIDATED

DULIEN STEEL PRODUCTS, Inc.
of Washington
9265 E. Marginal Way • Seattle 8, Wash. • LAnder 6000

RELAYING RAIL
TRACK ACCESSORIES
MIDWEST STEEL CORP.
Gen'l Off. CHARLESTON 21, W. VA.
Warehouses
CHARLESTON, W. VA.
KNOXVILLE, TENN. • PORTSMOUTH, VA.

FOR SALE
ALLOY STEEL
ROUND, HEX, SQUARE BARS
New York and Pittsburgh Warehouse Stocks

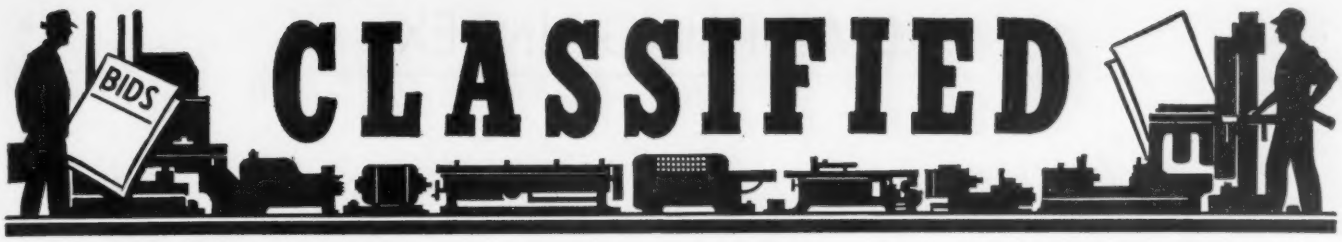
L. B. FOSTER CO.
9 Park Place, New York 7
Phone—Barclay 7-2111
P. O. Box 1647, Pittsburgh 30
Phone—Walnut 3300
Michigan Distributor
C. J. GLASGOW COMPANY
2809 Fenkell Ave., Detroit 3
Phone—Townsend 8-1172

RAILS
2,000 tons 90# prime relayers with angle bars and tie plates. Immediate shipment.

M. K. FRANK
480 Lexington Ave. New York 17, N. Y.
Phone: ELdorado 5-2885-6

BORING MILLS, 24"-42"-52"-66"-72"-96".
FLANGER, ¾" McCabe.
GRINDER, Knife 10' Bridgeport, M.D.
GRINDER, Surface #16 Blanchard.
HAMMERS, Nazel 3-B, 4-B & 5-N.
LATHE, Turret 24" Gisholt 6¼" hole.
MILLERS, Plain Nos.3 K&T and No.4 Cin.
MILLERS, Vertical Nos. 3 & 4 Cin.
SHAPER, 36" Morton Draw Cut.
SLOTTER, 12" Putnam, 33" table, B.D.
STRAIGHTENER, Plate 110"x1¼", H&J.

WEST PENN MACHINERY COMPANY
1208 House Bldg. Pittsburgh 22, Pa.



CLASSIFIED

Help Wanted

MANAGER OF STEEL WAREHOUSES

Steel company needs manager for multiple steel warehouse division located in East. Must have sales experience cold rolled sheet products and administrative ability to direct organization. Salary commensurate with experience and ability. Give complete personal history and work experience in first letter.

Write Box 208 Suite 617
1457 Broadway New York, N. Y.

CORE ROOM SUPERINTENDENT

Long established and successful company operates two foundries with common core room . . . Needs man of more than normal ability to administrate and supervise core room which employs one hundred persons . . . Must be 35 to 50 years of age and have basic core making experience . . . Excellent salary and steady employment . . . References required. Submit complete experience and recent photograph . . . All replies will be held in strict confidence.

Write Box 275
STEEL, Penton Bldg., Cleveland 13, O.

ASSISTANT TO SALES MANAGER

Tool and Alloy Steel Warehouse. Must have practical experience supplemented, if possible, with technical knowledge of Tool and Alloy Steels, their heat treatments and applications. Must be a good correspondent and able to intelligently discuss our products with the customer. Reply in detail with salary requirements.

Amalgamated Steel Corporation
7835 BROADWAY, CLEVELAND 5, OHIO

CHIEF DRAFTSMAN

For large structural steel fabricating company located in Pittsburgh area. Excellent opportunity for high caliber man. Write Box 273, STEEL, Penton Bldg., Cleveland 13, O.

CAPABLE ERECTION MANAGER

Prefer engineering graduate experienced in planning construction of all types steel buildings, bridges, capable making costs and handling erection crews. Excellent opportunity for permanent employment competent engineer.

Write Box 262,
STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

DISTRICT SALES MANAGER
Full responsibility for Northeastern territory office representing alloy steel producer. Prefer engineering graduate with outstanding record of accomplishment, ability to train sales organization, and technical knowledge of alloy steels. Give full details regarding age, experience, education, references and previous earnings. Write Box 269, STEEL, Penton Bldg., Cleveland 13, O.

CIVIL ENGINEER FOR STEEL FABRICATING shop, permanent position with unusual opportunity for advancement in small organization. Apply Tippett & Wood, Phillipsburg, N. J.

Employment Service

SALARIED POSITIONS $2,500-$25,000. THIS thoroughly organized confidential service of 37 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated through a procedure individualized to each client's requirements. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details. R. W. BIXBY, Inc., 110 Dun Bldg., Buffalo 2, N. Y.

Professional Services

THE F. A. SCHNEIDER CO.

Consulting Engineers

Manufacturing Buildings, Process Plants and Related Building Structures, Designs, Layouts and Details.

118 E. Southern Ave. Bucyrus, Ohio

SPECIAL MANUFACTURERS TO INDUSTRY . . . *Since 1905*

Metal Specialties comprised of STAMPINGS, FORMING, WELDING, SPINNING, MACHINING. All Metal or Combined with Non-Metal Materials

WRITE FOR FOLDER
LARGE SCALE PRODUCTION
OR PARTS AND DEVELOPMENT ONLY

GERDING BROS.
SE THIRD VINE ST. ● CINCINNATI 2, OHIO

SUB-CONTRACT WORK WANTED

STAMPING AND FORMING LIGHT METAL PARTS. WE CAN FURNISH THE DIES.
ASSEMBLING
PROMPT PRODUCTION ANY QUANTITY.
IMMEDIATE QUOTATION UPON RECEIPT OF BLUE PRINTS.

CAMBRIDGE HINGE TUBE & CHAPLET WORKS, INC.
CAMBRIDGE, NEW YORK TELEPHONE 95

Opportunities

FOR SALE

STRUCTURAL STEEL FABRICATION PLANT EQUIPMENT AND INVENTORY

Plant is located in the North Central section of the United States. Address Box 276, STEEL, 520 N. Michigan Ave., Chicago 11, Illinois

TOOL STEEL BUSINESS

For Sale

Including equipment and stock of non-tempering and oil hardening tool steel. $3500

HERCULES STEEL CO.
246 Hanna Bldg. Cleveland 15, O.

FOR SALE
Old well established California manufacturing and steel fabricating plant, fully equipped and operating. 5 acres, fence enclosed tract. Write: H. R. Ragan, P. O. Box 344, Baldwin Park, California.

ALMA WANTS YOUR BUSINESS

- Job Machining
- Production Machining
- Automatic Screw Machining
- Heat Treating—Welding
- Tools—Jigs—Fixtures—Gages
- Special Machinery
- Designing—Engineering
- Parts—Made to order in volume
- Products Wanted—To Manufacture
- Accurate Work—Prompt Delivery

Confidential Handling of all Inquiries

ALMA MOTOR COMPANY
Office—1434 National Bank Bldg.
Detroit 26, Mich.
Telephone: Woodward 5-0643

ADVERTISING INDEX

A

Allis-Chalmers Mfg. Co. 23
Alma Motor Co. 131
Aluminum Company of America 21
American Roller Bearing Co. 121
American Rolling Mill Co., The 57
American Steel & Wire Co. 11
Associated Business Papers, The 117

B

Babcock & Wilcox Tube Co., The ..... Inside Front Cover
Beatty Machine & Mfg. Co. 116
Belmont Iron Works, The 128
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. 111
Bixby, R. W., Inc. 131
Blaw-Knox Division of Blaw-Knox Co. 118
Bliss, E. W., Co. 59
Brosius, Edgar E., Co., Inc. 120
Bryant Chucking Grinder Co. 43
Budd Co., The 128
Bundy Tubing Co. 79
By-Products Steel Co., Division of Lukens Steel Co. 113

C

Cattie, Joseph P., & Bros., Inc. 128
Century Electric Co. 89
Champion Rivet Co., The 81
Cincinnati Shaper Co., The 2
Cleveland Crane & Engineering Co., The ..... Back Cover
Colonial Broach Co. 75
Columbia Steel Co. 11
Copperweld Steel Co. 82

D

Danly Machine Specialties, Inc. 77
Dempster Brothers, Inc. 3
Detroit Steel Corporation, Reliance Steel Division 28
Diamond Mfg. Co. 128
Differential Steel Car Co. 126
Dulien Steel Products, Inc. 130

E

Electric Controller & Mfg. Co., The 114

F

Fafnir Bearing Co., The 12
Farval Corporation, The . Inside Back Cover
Follansbee Steel Corporation 87
Foster, Frank B., Inc. 129
Foster, L. B., Co. 130
Frank, M. K. 130

G

General Electric Co. 9, 14, 15
General Steel Warehouse Co., Inc. 73
Gerding Bros. 131
Gibson, William D., Co., The 20
Gisholt Machine Co. 13
Great Lakes Steel Corporation 48
Guide Co. 123

H

Hanlon-Gregory Galvanizing Co. 90
Harnischfeger Corporation 125
Harrisburg Steel Corporation 125
Hindley Mfg. Co. 127
Horsburgh & Scott Co., The 110

I

Inland Steel Co. 119
International Nickel Co., Inc., The 32
Irwin Manufacturing Co., Inc. 127

J

Jackson Iron & Steel Co., The 128
James, D. O., Gear Manufacturing Co. .. 125

K

Kearney & Trecker Corporation 6, 7

L

Linde Air Products Co., The 10
Logemann Brothers Co. 109
Los Angeles Sheet Metal Mfg. Co. 129
Lukens Steel Co., By-Products Steel Co. Division 113

M

Medart Co., The 97
Midwest Steel Corp. 130

N

National Steel Corporation 48

O

Ohio Locomotive Crane Co., The 127

P

Pittsburgh Crushed Steel Co. 126
Potter & Johnston Machine Co. 17
Preformed Wire Rope Information Bureau 95

R

Reliance Steel Division, Detroit Steel Corporation 28
Remington Rand, Systems Division 93
Ryerson, Joseph T., & Son, Inc. 31

S

Salem Engineering Co. 85
Schneider, F. A., Co. 131
Seneca Wire & Mfg. Co., The 128
Sheffield Corporation, The 26
Shuster, F. B., Mfg. Co., Inc., The 127
Simonds Abrasive Co. 18
Simonds Gear & Mfg. Co., The 128
Sinclair Refining Co. 22
Stuart, D. A., Oil Co., Ltd. 122

T

Tennessee Coal, Iron & Railroad Co. 11
Thomas Steel Co., The ..... Front Cover

U

Union Carbide & Carbon Corporation 10
Union Chain & Manufacturing Co., The .. 51
United Engineering & Foundry Co. 25
United States Steel Corp., Subsidiaries . 8, 11
United States Steel Export Co. 11
United States Steel Supply Co. 8
Utica Radiator Corporation 126

V

Veeder-Root, Inc. 19

W

Warner & Swasey 24
Weldit, Inc. 123
Wellman Engineering Co. 5
Wesche, B. A., Electric Co. 126
West Penn Machinery Co. 130
Wheeling Steel Corporation 127
Whitehead Stamping Co. 128
Williams-White & Co. 112

Y

Young Brothers Co. 115
Youngstown Sheet & Tube Co., The 16

~ ~ ~

Table of Contents Page 27

Classified Advertising Pages 129,130,131

$32,700 labor savings on 9 gas engines with Farval

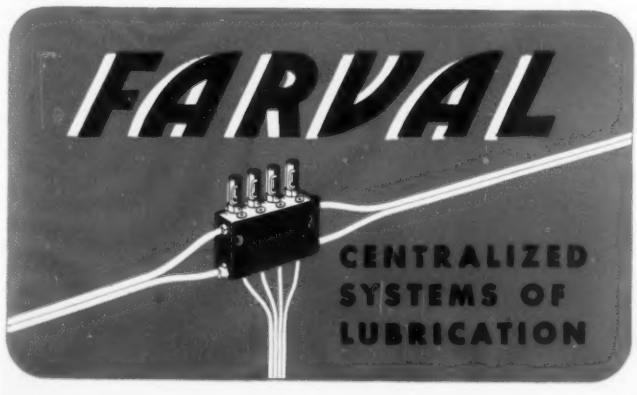
IN a blast furnace power house, the gas engines driving generators were lubricated by hand. Each engine kept one man busy all the time filling and adjusting grease cups for 256 bearings. Nine engines required the full time of 27 oilers per 24-hour day, 365 days a year.

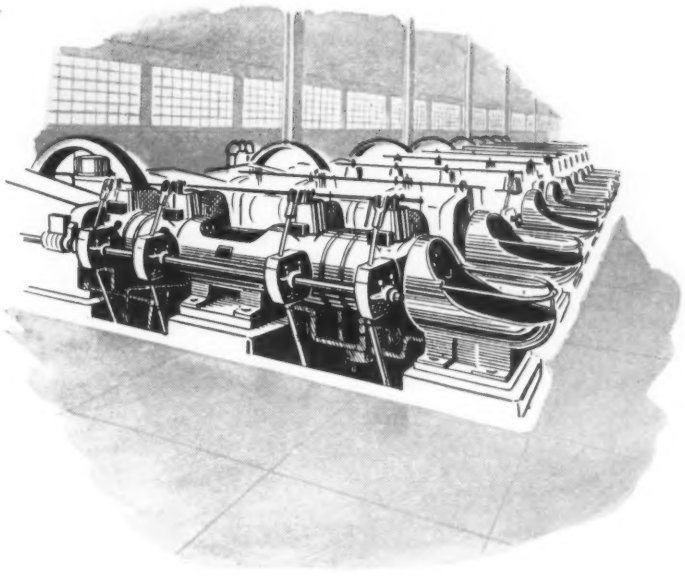
To reduce the cost of hand oiling, Farval Centralized Lubrication was installed—initially on one engine as a test. One Farval unit lubricated 240 bearings at 4-hour intervals. Another unit lubricated 16 eccentric bearings every 20 minutes. The first year's experience showed that one man with Farval could look after 2 to 3 engines, requiring only 4 oilers per turn for all 9 engines. Result—Farval was ordered for all 9 engines. At the then prevailing rates, the reduction in manpower alone indicated a saving of $32,700 the first year. The saving in labor paid for Farval in a few months.

Adequate lubrication eliminated all metal-to-metal contact at bearings. There is less drag on the engines. Bearing replacement is no longer a problem. Engines run cooler, operate smoothly and quietly. The men are enthusiastic about Farval.

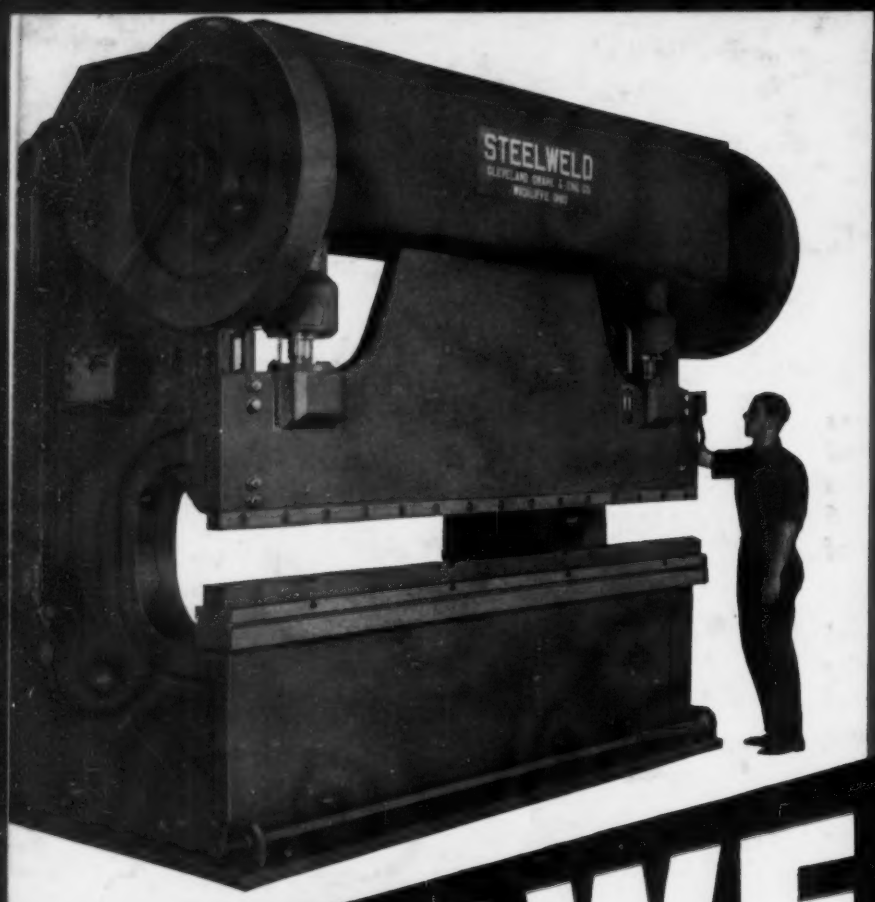
Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, at regular intervals. Farval is the Dualine System with the Positive Piston Displacement Valve. This valve has but two moving parts and is fully adjustable, with a Tell-tale indicator at each bearing to show the job is done. For a full description of Farval, write for Bulletin 25, The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.





FARVAL—*Studies in Centralized Lubrication* No. 89



STEELWELD PRESSES make possible easy fabrication of parts that would be difficult and expensive by ordinary methods. They speed production and lower costs because press work is fast. After easily-inserted dies are setup, parts may be formed as quickly as they can be placed into and removed from a press.

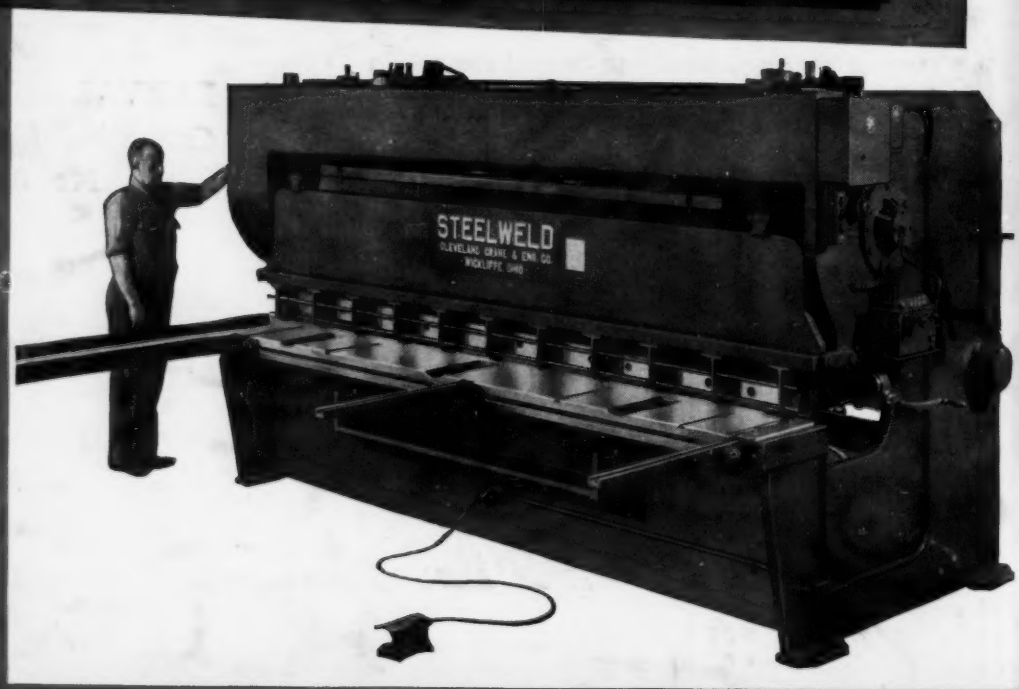
There is a complete line of Steelweld Presses for all plate thicknesses up to one inch and lengths to 20 feet. They can be furnished with many extra features to best suit your requirements.

Hundreds of these modern machines are serving leading concerns throughout the United States and in many foreign countries.

STEELWELD
PRESSES AND SHEARS

STEELWELD *Pivoted-Blade* SHEARS are entirely different in operating principle from any other shear now on the market. They have no slides or guides to wear out of true and cause inaccuracies. The upper blade operates on two heavy pivot pins secured to the end housings and travels in a circular path. This makes possible many outstanding features heretofore unavailable in any shear at any price.

Steelweld Shears have been developed for cutting plate of all thicknesses from 12 gauge to 1¼ inch and for lengths of 6 to 18 ft.



THE CLEVELAND CRANE & ENGINEERING CO.
7514 East 281st St., WICKLIFFE, OHIO

STEELWELD PRESSES AND SHEARS